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Southern Medical Journal

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TABLE OF CONTENTS

The Clinical Significance of a Mobile Colon. Milford O. Rouse and Cecil O. Patterson, Dallas, Texas 963

Discussed by Andrew Small, Dallas, Tex.; W. F. Thornton, Lynchburg, Va.

Incontinent Patients in a Chronic Hospital. Orthello R. Langworthy, James A. Jarvis and Lloyd G. Lewis, Baltimore, Maryland 969

A Tube for the Removal of Open Safety Pins from the Trachea and Esophagus. Edwin N. Broyles, Baltimore, Maryland 973

Roentgen Therapy in Skin Cancer. Harold G. F. Edwards, Shreveport, Louisiana 974

Discussed by J. M. Martin, Dallas, Tex.; Fred M. Hodges, Richmond, Va.

Diagnosis and Treatment of Neoplasms of the Skin. Robert L. Kelly, Louisville, Kentucky 979

Discussed by Lee McCarthy, Washington, D. C.; Walter Teichmann, Washington, D. C.

Report of a Case of Paget's Disease of Bone with an Associated Optic Atrophy and a Brief Review of the Literature. William S. Dosher, Richmond, Virginia 985

A Review of Cases of Congenital Dislocation of the Hip Treated at the North Carolina Orthopedic Hospital. W. M. Roberts, Gastonia, North Carolina 987

Discussed by Fred A. Jostes, St. Louis, Mo.; Athey R. Lutz, Huntington, West Va.

Pernicious Malaria in Children: A Report of 24 Cases. Julian P. Price, Florence, South Carolina 991

Relation of Thyrotoxicosis to Emotions. Alphonse McMahon, St. Louis, Missouri 996

Pulmonary Embolism with Special Reference to the Acute Cor Pulmonale: Report of a Case. Joseph H. Cannon, Charleston, South Carolina 1002

Discussed by Louis Hamman, Baltimore, Md.

The Diagnostic Value of Venous Pressure Determinations in Certain Diseases. Rufus D. Moore, Jr., Little Rock, Arkansas 1007

Causes of Hypertension in Young Individuals with Special Reference to Coarctation of the Aorta: Clinical Report of a Case. W. Kendrick Purks, Vicksburg, Mississippi 1009

The Incidence of Major and Minor Allergy in the Deep South. David M. Pipes, Richmond, Virginia 1012

Discussed by Marion T. Davidson, Birmingham, Ala.; Oscar Swineford, Jr., University, Virginia.

Continued on Next Page

TABLE OF CONTENTS—Continued

Local Responsibilities in Communicable Disease Control. J. A. Milne, Jackson, Mississippi 1015

Discussed by James A. Crabtree, Knoxville, Tenn.; Myron G. Tull, Baltimore, Md.

Implantation in Ozena. Joseph Isaac Kemler, Baltimore, Maryland 1021

Uterine Rupture Involving the Vagina cine Given Intravenously in a Case of Psoriasis. Samuel F. Rosen, Savannah, Georgia 1024

Discussed by L. Williams Lord, Baltimore, Maryland.

Congenital Pyloric Stenosis in Sisters: Report of Two Cases. Edward Jelks, Jacksonville, Florida 1027

Uterine Rupture Involving the Vagina and Bladder, with Recovery. Jerome P. Long, Jr., Memphis, Tennessee 1028

Potassium Permanganate Poisoning: Report of Fatal Case. Christopher Johnston, Durham, North Carolina 1030

Dugas on Surgical Principles: A Manuscript of 1874. Cecilia C. Mettler, Augusta, Georgia 1031

EDITORIALS 1033

The New Orleans Meeting

Bone Marrow and Amidopyrine

X-Ray for Amenorrhea and Sterility

Androgens and Estrogens: Nature and Source

Twenty-Five Years Ago

NEW ORLEANS--WHERE WE MEET 1036

New Orleans as a Medical Center

BOOK REVIEWS 1038

SOUTHERN MEDICAL NEWS 1042

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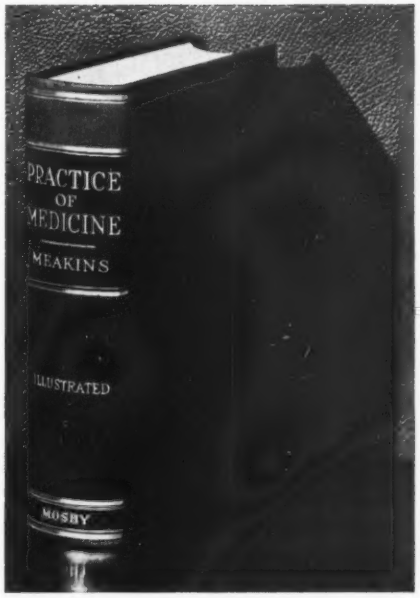

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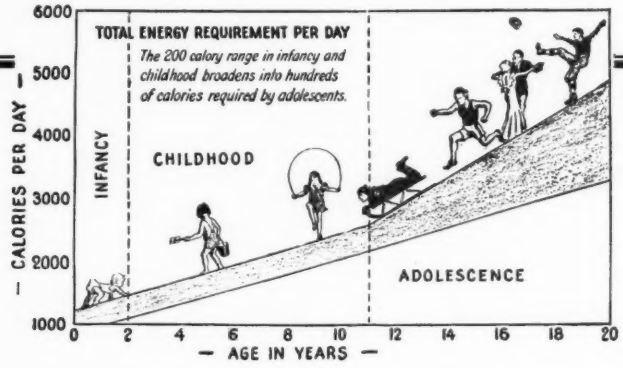

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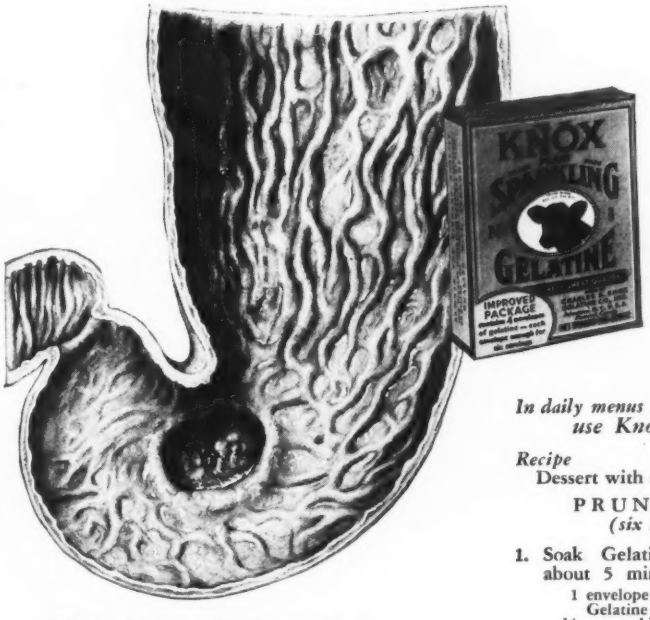

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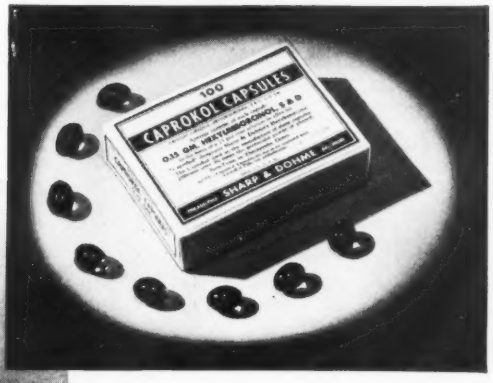

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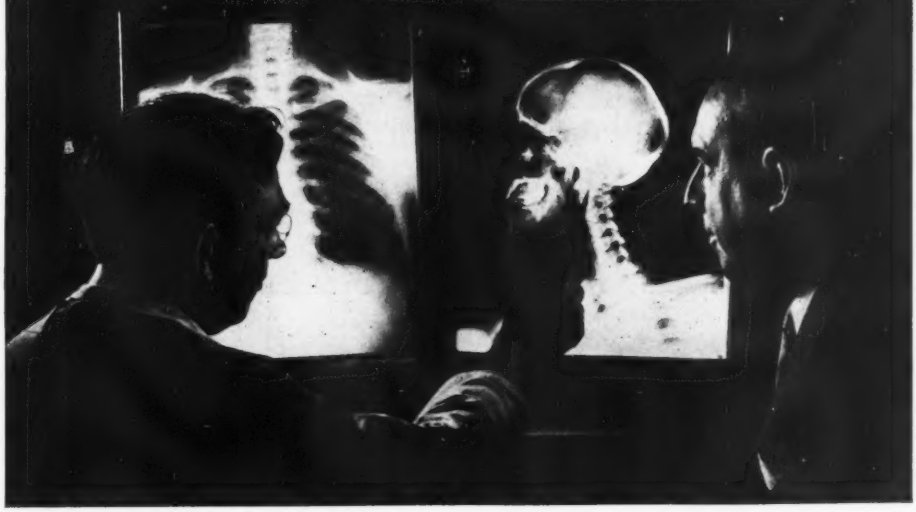

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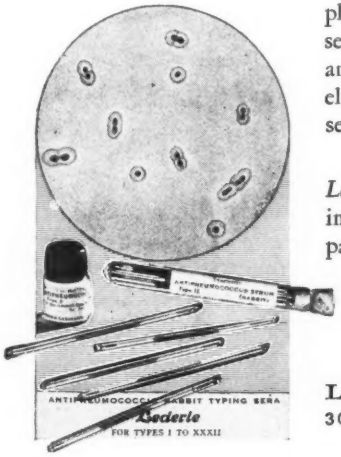

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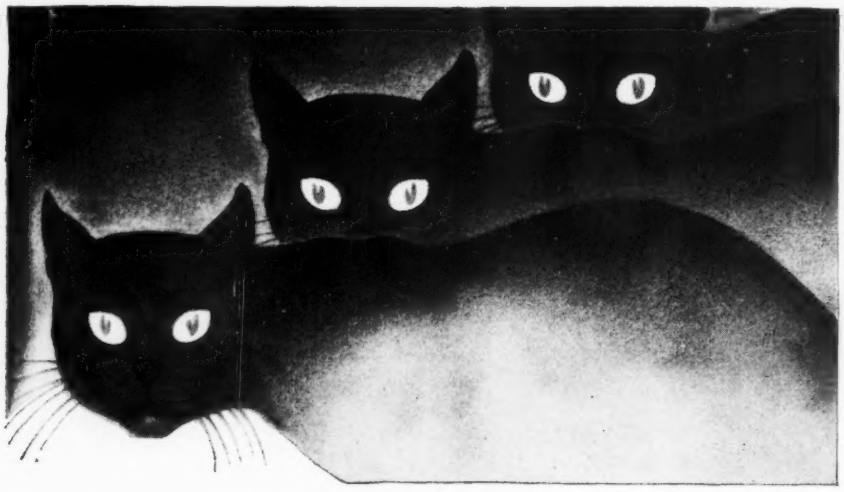

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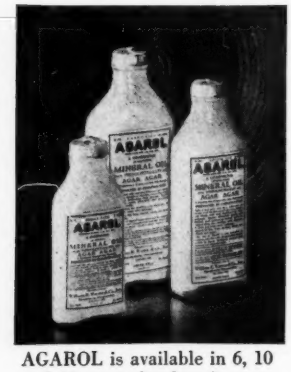

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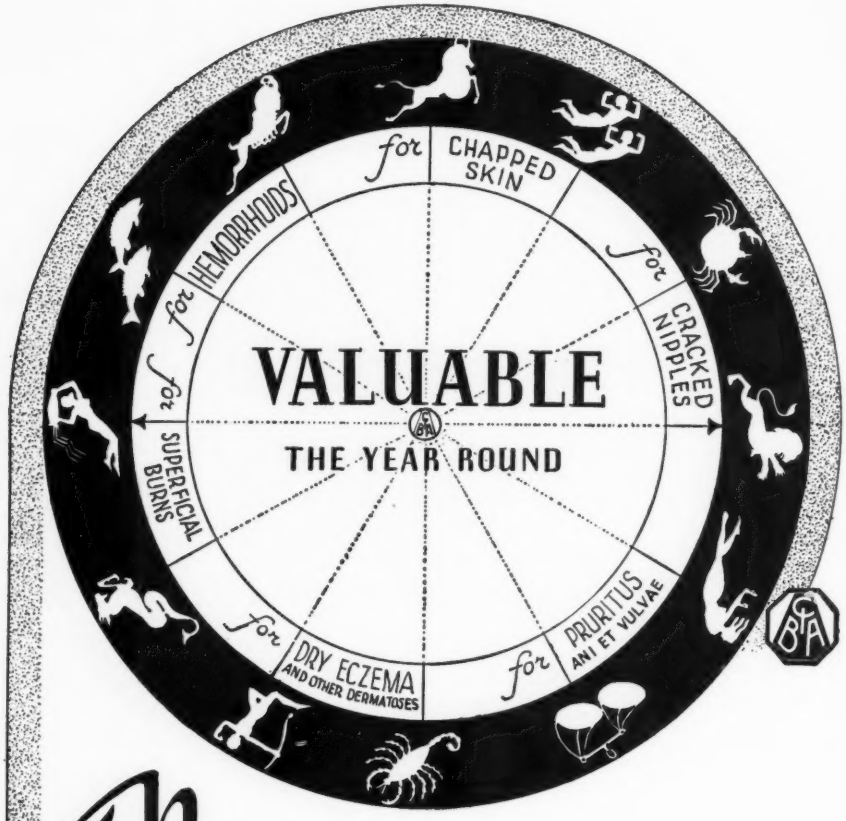

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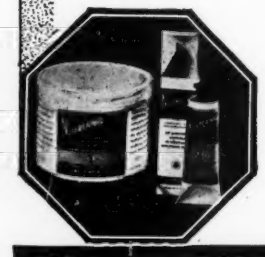

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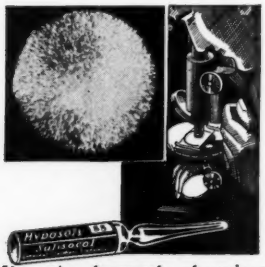

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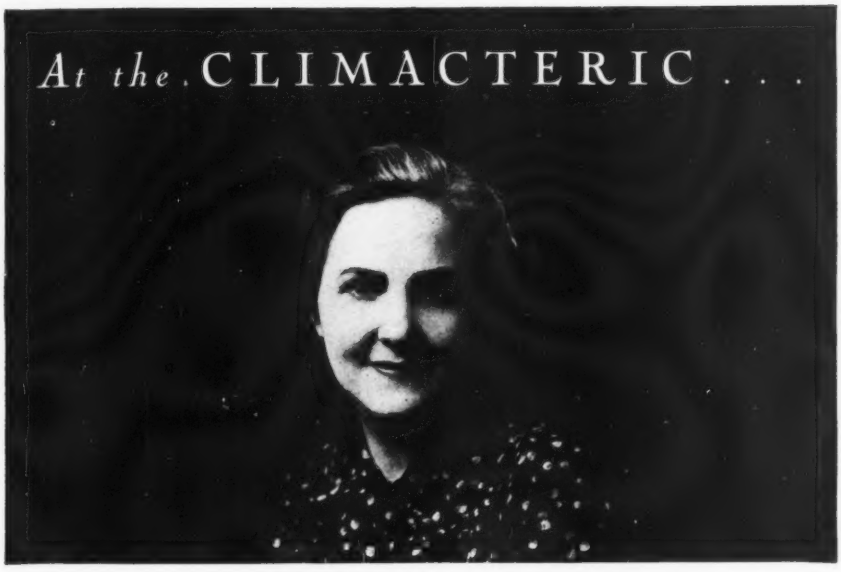

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(1) N. Y. S. Jl. of Med., Oct. 1, 1936 (2) Med. Clin. of N. A., July, 1935

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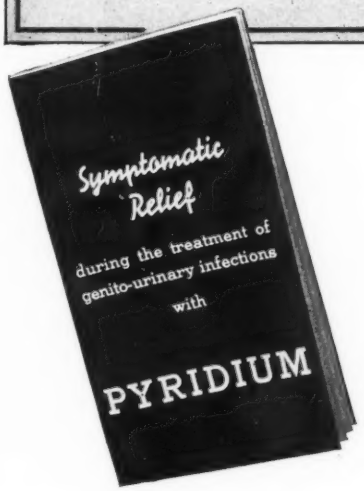

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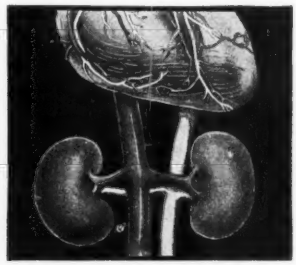

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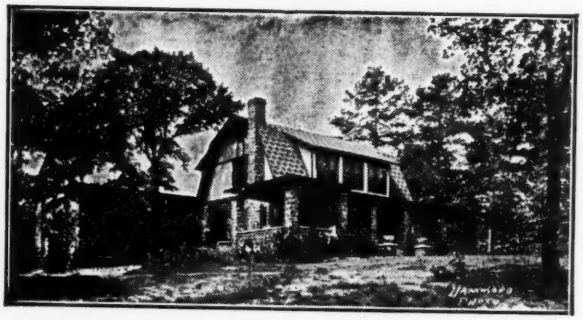

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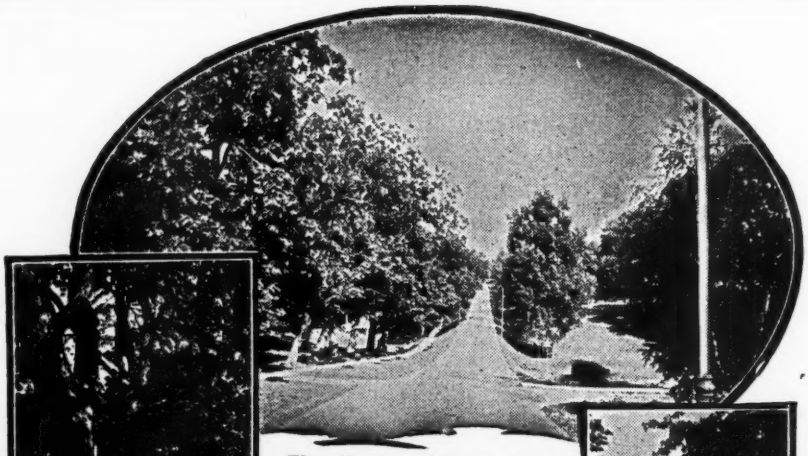

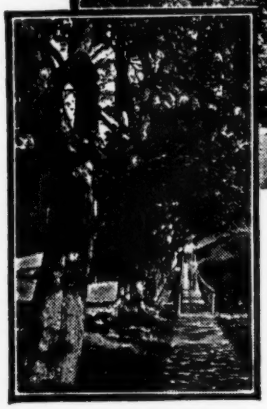

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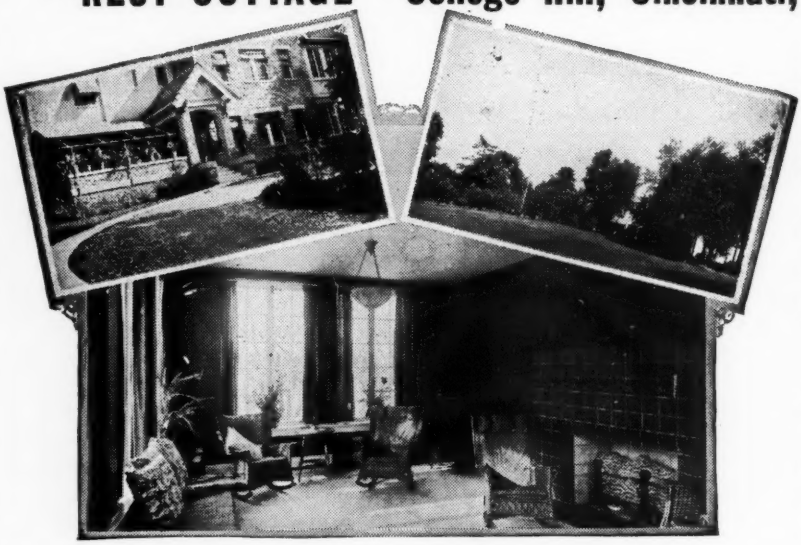

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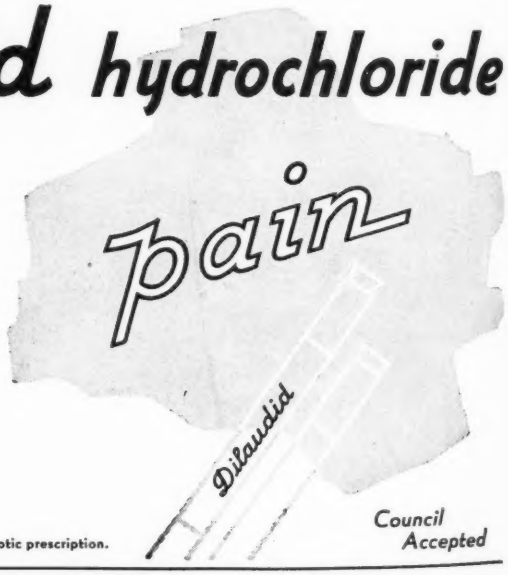

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THE CLINICAL SIGNIFICANCE OF A MOBILE COLON*

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There are frequent situations, both medical and otherwise, where the factors involved are so commonplace or seem at such close range, as it were, that their true significance is unrecognized. This is particularly true in the medical world of that anatomical abnormality of the abdomen best described as the mobile colon. Those of us who do gastro-intestinal radiology have time and again noticed the right side of a colon that travels freely, either spontaneously or upon manipulation, practically anywhere within the right half of the abdomen. Or the surgeon has noted at the time of an appendectomy that the cecum and a major portion of the ascending colon would conveniently come into the wound and even lie out on the anterior abdominal wall, usually interpreted by the surgeon as just an extra technical convenience to him.

Anatomists and surgeons first began seeing the light and have written a few papers on the subject of the significance of a mobile colon and what can be done about it. This paper will attempt to bring home to the gastro-enterologists, the individuals who should be best qualified to recognize and advise treatment of these conditions, the potential meaning of the mobile colon. Most progress in the future will be made when gastro-enterologists and other internists conscientiously set about studying and interpreting the relationship of these anatomical states within the abdomen to the groups of symptoms presented by patients.

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The scope of this paper will not permit a detailed description of the embryology. In the bibliography will be found references to the excellent work already reported on this subject. A brief animated motion picture (of which *Fig. 1* shows three typical successive stages) illustrates in the embryology the migration, rotation, descent and ultimate fixation of the normal colon. It is of special significance that the superior mesenteric artery is the chief axis about which take place the processes just described (see also *Fig. 7*, illustrating the distribution of the branches of the superior mesenteric artery).

TYPES OF ABNORMALITIES

Abnormalities may exist, occurring at any one of the four embryological stages described above, but this paper will be confined primarily to the discussion of abnormalities of descent and fixation. As pointed out in a former paper in which the authors collaborated, these anomalies of fixation may be grouped into three classes:

(1) Failure of the mesentery of the ascending colon to fuse in its entirety, which McConnell has termed the *prolapsed* type, as shown in *Fig. 2 A* and *Fig. 3 P*. The ascending colon remains straight, and has a uniform medial mobility and a marked vertical mobility, usually up to six inches (see also *Figs. 4* and *5*).

(2) Failure of the mesentery to fuse in part, as in *Fig. 2 B*. If the lower portion is fixed, then the upper portion and the right (hepatic) flexure may fall vertically downward to cause the *collapsed* type as described by McConnell (*Fig. 3 C*), the radiographic outline of which resembles a concertina. Or the upper segment may have a more medial course to give the *angulated* type of McConnell (*Fig. 3 A*).

(3) Various types of mal-descent of the cecum, which then allows a marked redundancy of the ascending colon (*Fig. 2 C*).

It should be emphasized that the best and only sure method of ascertaining the position and mobility of a colon is by a fluoroscopic ex-

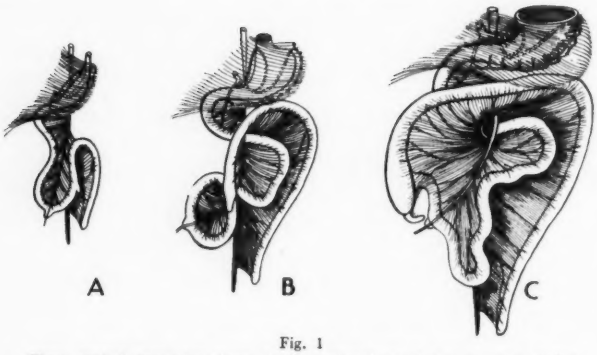

Fig. 1
Three typical successive stages in the embryology of normal colon (after Dott). Note the superior mesenteric artery as axis.

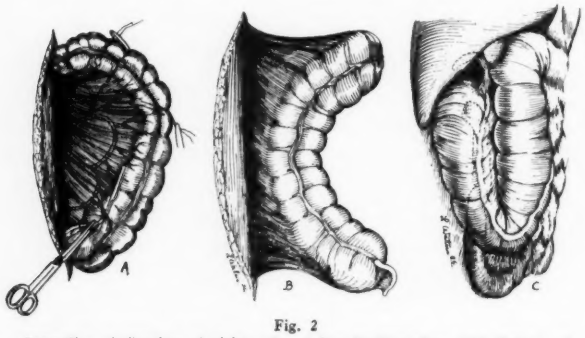

Fig. 2
Anomalies of fixation of right colon (after McConnell). (A) Failure of mesentery to fuse in entirety. (B) Failure to fuse in part. (C) Maldescent of cecum.

Fig. 3
Types of mobile right colon (after McConnell). (P) Prolapsed. (C) Collapsed. (A) Angulated.

amination in both vertical and horizontal planes. A barium enema probably affords the best opportunity for full observation. (If such an enema is given properly, the patient can stand as well as lie down, in perfect comfort.) A barium meal by mouth, observed at intervals of 12, 24 and 48 hours, will also give valuable information on motility as well as mobility. The authors routinely follow through the barium meal first, then administer the barium enema. Properly made plates have a double value: they reassure the clinician as to his observations, and they constitute an effective means of illustrating to the patient the basic situation, especially when compared with plates of a normally placed right colon.

It is always well to make plates in the vertical and horizontal positions, as well as in the horizontal position with the ascending colon displaced toward the midline as far as possible without undue discomfort to the patient (*Figs. 4* and *5*). The crest of the right ilium makes a convenient fixed point of comparison of positions.

Fluoroscopically, it is the marked vertical and medial mobility of the right colon that counts. It is a well recognized fact that there is a certain amount of mobility in a normally fixed ascending colon. A perfectly logical inquiry concerns the maximum range of mobility before disease is signified. The authors feel that it is fruitless to set any arbitrary limits of normal range. The x-ray observations are of value only as correlated with and interpreted in the light of the clinical history and physical findings. The writers are urging other gastro-enterologists to seek to coordinate anatomical facts, as gleaned from radiology, with the symptoms complained of by the patient.

In bipeds the right colon is normally fixed for the double purpose of keeping the heavy portion of the digestive tract from slipping down into the pelvis when the patient stands (*Fig. 6*) as well as serving as a fixed base from which the peristaltic rushes may carry the fecal residue onward toward the rectum. Symptoms from a mobile colon can be therefore simply interpreted as due either to (1) traction or (2) obstruction, usually partial. There is no absolutely pathognomonic group of symptoms pointing to a mobile colon, but patient study (and especially a retrospective study) will almost invariably show that the symptoms do not fit in perfectly with any of the usually well recognized acute conditions of the abdomen and do not correspond with the

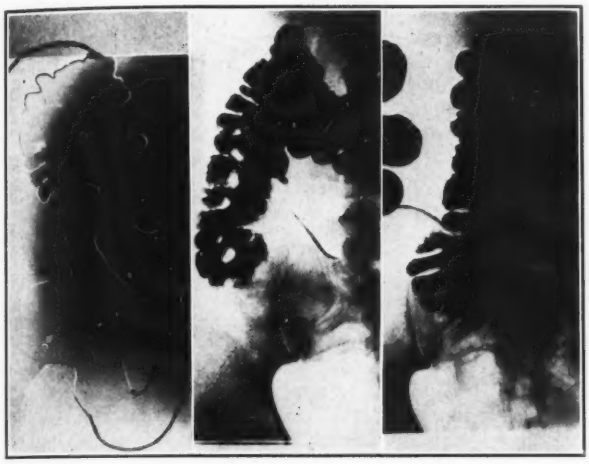

Fig. 4

Different locations of mobile colon as patient changes position. Note the crest of ilium as a guide post. (Left) Patient standing. (Middle) Patient recumbent. (Right) Ascending colon pushed to midline by examiner's hand.

Fig. 5

Diagrams of x-rays of Fig. 4. (A) Patient standing. (B) Recumbent. (C) Ascending colon to midline.

typical symptoms of the ordinary chronic abdominal pathological states. It is easily understood that the symptomatology may be extremely varied and is best interpreted by a study of function.

SYMPTOMATOLOGY

First to be considered is that group of cases where the underlying pathology of a mobile colon is most frequently overlooked. The patient will typically have two chief complaints: recurring pain in the lower abdomen, usually in the right side; and obstinate constipation. The history, both of pain and of constipation, often dates back to childhood. The patient will frequently volunteer the observations that attacks of pain are most apt to occur when several days have elapsed without a bowel movement or when an unusually large bulk of food has been ingested 6 to 24 hours previously; likewise that attacks have been relieved by securing a free evacuation of the colon, by purgatives, enemas or otherwise. Many times the patients have learned to secure comfort by forcibly pressing their thighs and knees against the abdomen, or by lying in certain positions or going through certain calisthenics. In each instance relief has come about by simply emptying out a distended right colon, thereby releasing a partial obstruction that has resulted from overloading a sewage system already functionally inefficient.

If the doctor sees the patient for the first time in the acute attack, he naturally suspects an acute or subacute appendicitis. But usually the episode has not started with epigastric pain; there may or may not be nausea or vomiting, usually not; there is no fever as a rule; no leukocytosis; no marked tenderness or rigidity at McBurney's point; and a distended cecum and ascending colon may be palpated.

The authors regard an appendix as potentially a stick of dynamite, and certainly do not advocate lightly passing by surgical consideration for a patient with an acute attack with symptoms like these. But if the sufferer gives a suggestive history as outlined, with several or many former attacks, and with the physical and laboratory findings described, he is entitled to reasonable expectant treatment, preferably in a hospital. A cleansing enema given with caution may bring relief more quickly than a scalpel. Then when the storm clouds subside, the physician can carry out a careful diagnostic x-ray study, to check up on a possible mobile colon. If surgery seems indicated later, it can be carried out through a right rectus or similar incision, permitting a thorough first-hand examination of the right colon and proper correction of any anatomical abnormalties present.

It is possible for an infection to be present in the appendix in addition to the anatomical partial obstruction under discussion. If leuko-

cytosis or other signs indicate, then certainly immediate surgery can be done, but it should be done through a small right rectus incision rather than a McBurney. If the appendix is acutely or even subacutely inflamed, then an appendectomy is all that is indicated at that particular time, but without increasing the hazard the surgeon can ascertain the real mobility of the right colon, with a view to a correction at a later date if indicated. But if the appendix is disappointingly innocent in appearance, the surgeon can then easily enlarge his incision to permit a thorough exploration of the right abdomen and a surgical correction of any anatomical anomalies observed. If the surgeon stops with the removal of such a harmless looking appendix, he may be embarrassed by having his patient have another attack before he gets home from the hospital.

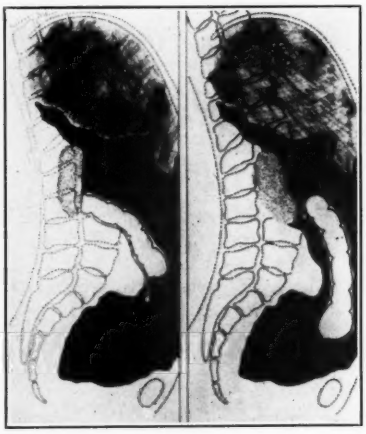

Fig. 6
Dynamics of abdominal viscera, stressing the supports of the colon.

We internists, who presumably do no surgery, need to be on the alert even more for the chronic cases, with complaints of obstipation, frequent pain of less intensity than that suggesting an acute abdomen, anorexia, malaise, "biliousness," headaches and malnutrition. The condition under discussion does not confine itself to that type of individual best described as a chronic gastro-intestinal invalid. It is an embryological defect, just like a hare-lip or cleft palate, and so can be found in a person otherwise robust and healthy, although it is usually one of the biggest factors leading to the ultimate perpetual dyspeptic with a mental attitude that is as unhealthful as his puny body.

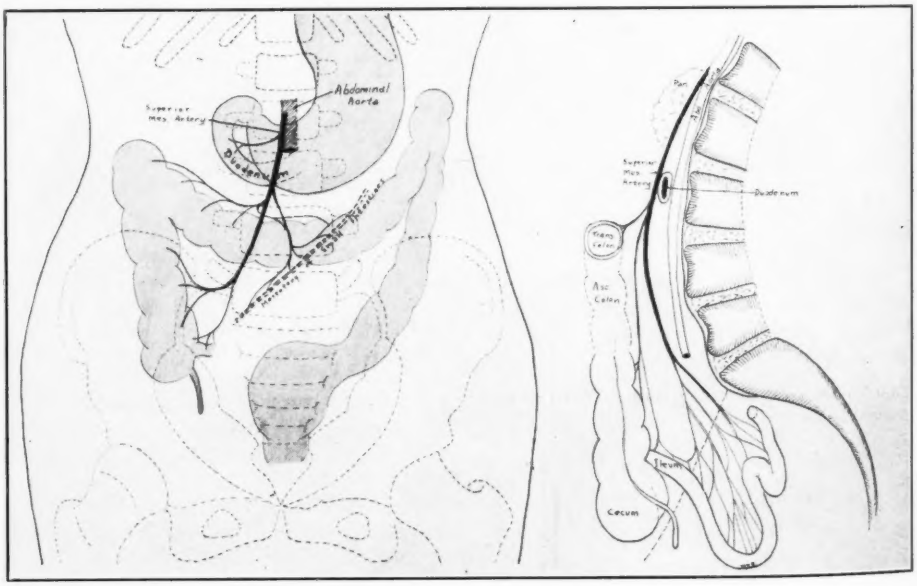

Fig. 7
Distribution of branches of superior mesenteric artery to intestines. Lateral view, on right, demonstrates pressure on duodenum by artery.

RELATION TO OTHER ORGANS

Brief attention must next be given to the surprisingly large group of cases of symptoms arising as a result of traction on the structures to which the ascending colon is attached. When this ascending colon is not properly attached to the posterior wall of the abdomen, its suspension will then depend partly on its own mesentery and partly on certain peritoneal attachments to the renal fascia or to the second stage of the duodenum (*Fig. 6*). Normally, the first part of the transverse colon is supported by the fixed right (hepatic) flexure of the colon, but when this right flexure is itself mobile, then the transverse colon at times drags on the gastrocolic ligament and on the pyloric end of the stomach. This in turn will make a definite pull upon the non-yielding superior mesenteric artery, which will then cause a partial obstruction in the third stage of the duodenum. (*Fig. 7* shows the distribution of the superior mesenteric artery and its branches to the intestines, with a lateral view demonstrating pressure on the duodenum by the artery.)

Quite frequently there are congenital peritoneal folds passing from the gallbladder to the duodenum or to the right (hepatic) flexure; through these a mobile colon may drag, directly or indirectly, on the gallbladder. As will be shown, quite frequently traction is exerted likewise on the right kidney.

Long before much attenton was paid to the mobile colon, obstruction of the third stage of the duodenum by the superior mesenteric artery had been described as duodenal dilatation, chronic duodenal ileus or stasis, chronic gastromesenteric ileus, or arterial duodenal ileus. The symptomatology in this group is characterized by attacks of severe epigastric pain after eating, usually relieved by assuming certain postures which will relieve the traction or weight of the right side of the colon. Vomiting is frequently observed, as well as a large amount of gas. Diagnosis is easily made by a careful fluoroscopic x-ray study which will show the markedly dilated duodenum (often approximating the size of the stomach), usually with visible antiperistalsis.

Besides the actual duodenal stasis just described, there may be symptoms brought about by the effects of traction of a mobile colon on the duodenum itself. This is due to a pull on certain peritoneal folds, leading to a duodenal irritation or to a partial obstruction. The recognition is made by a careful gastro-intestinal x-ray study.

It is not unusual to demonstrate with a mobile colon that the gallbladder itself lies unusually low or that its upper pole is distorted inward and downward. Anatomical studies have shown an occasional peritoneal fold continuous with the omentum from the gallbladder to the duodenum and right flexure of the colon. Cases are reported of chronic gallbladder disease responding without surgery to the gallbladder, when a mobile colon has been properly corrected. Likewise a few instances are recorded in which gastric ulcer was found associated with a mobile colon, with relief from the ulcer after the colon disease was remedied.

When the ascending colon is normally placed, the right (hepatic) flexure helps to support the right kidney. Anatomists report that there is never an instance of a mobile right kidney except in the presence of a mobile right colon. It is readily seen that a transmitted pull from such a colon to the right kidney can bring about Dietl's crises or hydronephrosis of the right kidney. The lesson here is that urologists and gastro-enterologists alike should recognize that pain referable to the right kidney may be due primarily to a mobile right colon.

As Dr. Andrew Small points out in a paper to be published elsewhere, there are other types of anomalies of the colon, representing other phases of a mobile colon, where the pain may even be experienced on the left side of the abdomen. In the female it is very easy to confuse the vague or unusual symptoms of a mobile colon with the symptomatology of pelvic disease. It is possible for the circulation in the pelvis to be altered by the downward pressure of an overloaded right colon which is unusually mobile. Thus there may be organic pelvic disease, plus a mobile colon.

The tragedy is that so frequently before the patient falls into the hands of a physician who correctly interprets the underlying anatomical factors he has had a regular surgical pilgrimage. An industrious surgeon, or usually a succession of surgeons, accomplish a removal of all available spare parts or a rearrangement of the abdominal "plumbing" of those organs which cannot be conveniently sacrificed.

TREATMENT

As difficult as is the correct interpretation of a mobile colon, even more so, usually, is the successful treatment. A colopexy, or surgical cor-

rection or anchoring, is the theoretically ideal way of overcoming the difficulties involved, but should not be resorted to indiscriminately. As internists, especially gastro-enterologists, there is much that we can do to help relieve the patient. Gain in weight; rest in bed in selected instances; abdominal exercises and the wearing of a comfortable abdominal support; tonic physiotherapy; and psychotherapy, are all valuable aids. Surgical correction is best reserved for the extreme cases, and for those individuals who do not respond satisfactorily under a medical regime.

The scope of this paper does not permit a detailed discussion of treatment, medical or surgical. The main purpose has been to call attention, from the viewpoint of gastro-enterologists, to that embryological defect known as the mobile colon, so that more diligent study can be made of the condition, especially in relation to abdominal symptoms. It is also fitting to invite our radiologist and surgical confréres to join in the problem. One of the first presentations of this subject was made before the Southern Medical Association in 1923 by a surgeon, the late Dr. A. B. Small, of Dallas. We challenge you, one and all, to continue this interesting study with us, and meet us back in this Section in a couple of years for a comparison of observations, to the end that further worth while contributions may be made to therapy as well as to diagnosis.

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DISCUSSION (*Abstract*)

Dr. Andrew Small, Dallas, Tex.—In this day of reconstructive surgery much is made of the crippled and underprivileged child. Is not a child with a crippled colon just as underprivileged as one with a club foot? He is far more likely to be misunderstood and mistreated. One reason for this is that we have not trained ourselves to differentiate normal from abnormal anatomy. We are too prone to advise appendectomy for a person who has had recurring abdominal pains, and when the appendix is found to be normal we are faced with the difficulty of exploring the abdomen through an inadequate incision.

The gastro-enterologist is in a position to recognize these anomalies. Surgeons should not attempt to operate without the benefit of a radiologic diagnosis.

As to treatment, some should be given the benefit of non-surgical procedures at least for a time. The more pronounced and clear-cut cases should have surgical correction as early as possible. The technic we use is that described in 1924 by the late Dr. A. B. Small. It is a corrective type of operation and from an expression used by Dr. Rouse it might be called "abdominal orthopedics."

Dr. W. F. Thornton, Lynchburg, Va.—I wish to mention a closely allied condition that presented itself to me in a very interesting manner some time ago. A patient of asthenic habitus on whom I did a gastro-intestinal examination complained of nausea associated with pain in the lower abdomen regularly appearing at about 5:00 a. m. Nothing was found responsible for the complaint. My associate, a man of some eighteen years' experience in radiology, asked me whether the cecum was low in the pelvis. It was and that was the only condition out of the ordinary noted during the examination. He had observed this condition frequently enough to rate it as important in patients of this habitus. He believed it due to a stasis that interfered with normal function in this area, made worse by the recumbent position during the night. A low cecum is of course a part of the condition described by Dr. Rouse.

So-called duodenal stasis is another closely related condition. There are several causes. It may result from persistence of congenital bands or adhesions about the duodenum. These anomalies were also nicely shown in the moving pictures of embryological development. The history in the few cases that I have observed has been striking and very helpful indeed in conjunction with x-ray diagnosis.

Dr. Rouse (*closing*).—I want to stress the fact that we are primarily seeking to stimulate more accurate and intelligent observations by gastro-enterologists and other internists on the question of the mobile colon.

INCONTINENT PATIENTS IN A CHRONIC HOSPITAL*

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INTRODUCTION

The care of incontinent patients is one of the important problems which confronts a hospital for chronic diseases. It occurred to us that it would be interesting to study the patients who were segregated in one ward for special care because of habitual vesical incontinence and attempt to arrive at some conclusion concerning the cause of the trouble in each case. Twenty-one male patients form the basis for this investigation. These men were all elderly individuals. It was considered important first to learn whether the trouble was due to local abnormalities of the genito-urinary tract or to disturbance of micturition dependent upon injury to the nervous control of the bladder.

It has been demonstrated that there are different levels of control of the vesical muscle in the central nervous system. If the peripheral nerves innervating the bladder are cut, small waves of vesical contraction develop (Langworthy and Hesser,[1] 1936). In case the spinal cord is transected above the sacral region these waves are influenced by afferent stimuli through the sacral portion of the spinal cord (Langworthy and Hesser,[1] 1937). There may in this case be powerful summation of the contraction waves. We have shown that there is a reflex mechanism in the region of the mid-brain which controls tone in the vesical musculature (Langworthy and Kolb,[2] 1933). Through this reflex pathway a strong, sustained wave of vesical contraction is initiated which permits complete evacuation of the bladder. A reflex pathway through the cerebral motor cortex further controls micturition. By electrical stimulation of this area micturition can be initiated or intravesical pressure can be lowered when it is high (Langworthy and Kolb,[2] 1935). Through this pathway the voluntary control of micturition is mediated. We must also postulate a still higher control of micturition associated with the highest integrative activities of the individual. The patient must be aware when the bladder is full and be able to respond in a normal way. Finally it should be realized that the reflex arcs controlling micturition may be injured not only on the motor side, but also on the sensory. This summary indicates the difficulty of interpreting the graphic records in terms of anatomical lesions in the nervous system.

METHODS

The work was possible through urological and neurological cooperation. The prostate was palpated by rectal examination. A cystoscopic study was made when deemed desirable. Each patient was examined carefully from a neurological point of view to determine as far as possible the anatomical injury to the central nervous system. The graphic records of vesical activity were obtained by means of an air-water manometer after the method described in detail in previous papers. No normal vesical record is included here; the reader is referred to previous reports.

EXPERIMENTAL FINDINGS

The bladder of an adult man usually holds a volume of 500 c. c. of fluid before micturition becomes imperative. The graph in *Fig. 1* indicates that the bladders of the patients had a much smaller volume. Thus in two a strong contraction of the vesical muscle occurred even when the bladder was empty. Five of the men had a bladder volume of 50 c. c. and four of 100 c. c. Only two of the patients had a vesical capacity of over 300 c. c. One of these was a case of tabes dorsalis. These two patients will be discussed in detail.

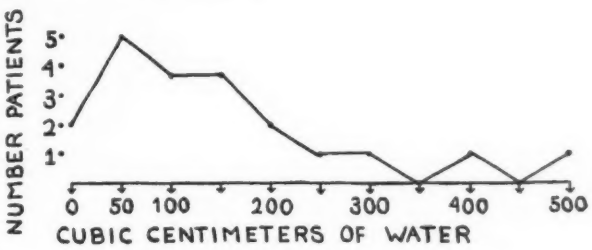

Fig. 1

*Received for publication January 6, 1937.

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All of the twenty-one individuals showed abnormalities pointing to injury of the central nervous system. For the purpose of discussion they will be divided into six groups, depending upon the level of the damage in the brain and spinal cord. This grouping corresponds roughly to the theoretical levels discussed in the introduction. The classification is a somewhat arbitrary one. In these elderly people there are often diffuse changes, depending upon arteriosclerosis or sometimes associated with syphilitic infections.

The six groups are as follows:

(1) Tabes, one case. (2) Spinal paraplegia due to syphilis, three cases. (3) Bilateral corticospinal tract injury, seven cases. (4) Hemiplegia associated with signs of bilateral encephalic lesions, 2 cases. (5) Hemiplegia, three cases. (6) Diffuse cerebral damage, five cases.

(1) *Tabes.*—One of the patients suffered from incontinence associated with tabes dorsalis. Another showed neurological signs of tabes with a superimposed hemiplegia; this individual will be discussed under the heading of hemiplegia.

Case 1.—The patient, an Italian of 56, had a penile sore thirty years before. In February, 1936, he developed numbness of the legs, and became unable to stand. Neurological examination showed abnormal pupils, absent knee and ankle jerks, and a positive Romberg test. Examination of the left knee revealed a Charcot joint. The Wassermann reaction was positive in the blood and spinal fluid. Because of urinary disturbances a retention catheter was placed in the bladder two months before the graphic record was made, and continuous drainage was instituted. Since that time the bladder has been irrigated daily.

The graphic record from this case is shown in *Fig. 2.* It is quite different from any reading from a case of tabes dorsalis which we have published previously. The bladder volume was 400 c.c. of sterile water. The vertical lines upon the graph indicate the points at which 50 c.c. units of fluid were introduced into the system. Between these additions of fluid the intravesical pressure was allowed to fall to a resting level. The pressure in the empty bladder was 9 cm. of water. There was a distinct rise in pressure after the introduction of each increment of fluid so that the graphic record presents a series of steps. With 350 c.c. of fluid in the bladder and an intravesical pressure of 48 cm., the patient was uncomfortable. The discomfort increased with the addition of a further 50 c.c. of fluid. The patient was then asked to attempt micturition. He was able to raise the pressure from 47 to 64 cm. but this rise in pressure could not be maintained and no fluid escaped from the urethra.

The typical record of bladder disturbances in patients with tabes dorsalis is unlike the one obtained here. The intravesical volume is large, usually exceeding 1,000 c. c. The resting intravesical pressure is low during bladder filling. The typical records are similar to the present one in that the patients are not able to initiate or maintain a strong vesical contraction sufficient to empty the bladder efficiently.

The unique points of the present record (*Fig. 2*) are related to the continuous drainage of the bladder with the retention catheter. The residual urine removed, the bladder was decreased in size. Undoubtedly overgrowth of scar tissue with an attempt at healing occurred in the damaged bladder wall. The bladder then became a small inert bag which showed little or no accommodation of the intravesical pressure to changes of vesical volume. For this reason the vesical volume was small and the intravesical pressure increased with the addition of each increment of fluid. The lack of powerful vesical contraction at the end of filling indicates the essential atonia of the vesical muscle due to the injury of the posterior sacral nerve roots.

(2) *Spinal Paraplegia Due to Syphilis.*—Three patients with evidence of a syphilitic infection had neurological abnormalities which were most marked in the lower portion of the body. They showed a syphilitic paraplegia. The neurological changes and the graphic records were similar in the three cases. One is used as an example.

Case 2.—B. C., colored male of 62 years, gradually became unable to walk and developed incontinence. The Wassermann reaction was positive in the blood and spinal fluid. The pupils were small and reacted sluggishly to light. The other cranial nerves were normal.

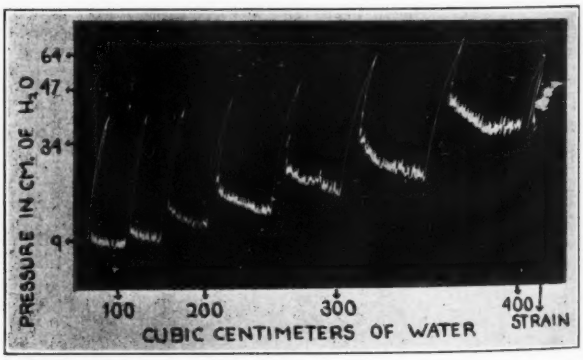

Fig. 2

Nor were any neurological abnormalities found in the arms. The patient took short steps and dragged the left leg. There were bilateral positive Babinski reflexes. The abdominal reflexes were active but the cremasteric reflexes were sluggish. The impression was that a lesion in the upper portion of the lumbar cord injured the cortico-spinal tracts bilaterally.

Due to the spasticity of the external sphincter the catheter had to be inserted upon a stylet. The graphic record is shown in *Fig. 3*. The intravesical pressure in empty bladder was high, 6 cm. of water. After the addition of the first 50 c.c. of fluid, a strong stretch reflex produced a contraction of the bladder which raised the pressure to 90 cm. of water. The contents of the bladder escaped around the catheter. The volume of this bladder was 50 c.c. The contraction wave at the end of filling was unusually quick and strong. The graphic record is similar to that usually found after bilateral injury of the cortico spinal tracts (Langworthy, Lewis, Dees and Hesser,[3] 1936). The patient was incontinent because he was unable voluntarily to control the vesical contraction. Micturition was frequent due to the small vesical capacity.

Fig. 3

(3) *Bilateral Injury of Cortico-efferent Tracts.*—Seven cases belong in this group. They differ from those considered in the previous section only in the fact that the anatomical lesions were not in the spinal cord, but rather in the internal capsule or cerebral cortex. The bladder symptoms and the findings in the graphic records were somewhat similar to those just described.

Associated with the injury of the cortico-efferent fibers bilaterally in the forebrain there were mental disturbances which were classified as marked in four and moderate in three. Pseudobulbar palsy manifested itself as difficulty in speaking and swallowing and in emotional outbursts.

The Hoffmann reflex in the hand when positive suggests damage to the cortico-efferent tracts. In all but one of the patients the Hoffmann reflex was present on both sides. Bilateral positive Babinski reflexes were demonstrated in all seven cases.

There was a great variation in the size of the bladder as observed in the graphic records. In five the volume was 150 c. c. or less. The vesical volume in one case was 300 c. c. and in another 500 c. c. The vesical muscle contracted strongly in one case before any fluid was introduced into the system. For the purpose of discussion two cases will be discussed, one with a small vesical capacity and another with a large capacity.

Case 3.—The first patient (J. L.) was admitted to the hospital in 1936 following a stroke. On the day of the neurological examination the patient had poor comprehension and was totally unable to speak. There was difficulty in swallowing. He coughed constantly. All the muscles supplied by the cranial nerves were weak. Extra-ocular movements were of small amplitude. The face was expressionless. A right hemiplegia had produced considerable contracture. There were positive Hoffmann and Babinski reflexes bilaterally and a bilateral ankle clonus.

The catheter was placed in the bladder and 25 c.c. of urine removed. The apparatus was then connected. Before any fluid entered the bladder a powerful contraction of the muscle raised the pressure to 90 cm., and ejected the catheter from the urethra.

Case 4.—The second example, J. A., a white man of 62, was admitted because he was paralyzed and unable to speak.

Urological examination showed a prostate of about normal size. The anal sphincter was of good tone. Cystoscopic examination revealed no elevation of the trigone and no prostatic hypertrophy. There was no residual urine.

Neurological examination showed a motor aphasia. The extra-ocular movements were of small excursion. The tongue could not be protruded. There was contracture of the extremities on the right side. The Hoffmann reflex was positive on the left: it could not be tested on the right due to the contracture. The abdominal and cremasteric reflexes were absent. A positive Babinski reflex could be obtained on both sides.

The graphic record of vesical activity is shown in *Fig. 4*. The capacity of the bladder equaled an average normal one of 500 c.c. The pressure in the empty bladder was 6 cm.; this is higher than normal.

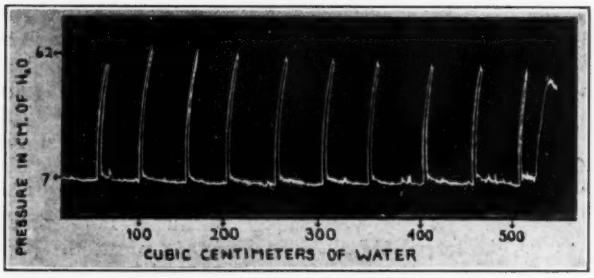

Fig. 4

Indeed before filling was complete the resting pressure was 16 cm. At 500 c.c. a well sustained contraction raised the pressure to 62 cm. and the bladder emptied. The only abnormal feature of the record is the high intravesical pressure.

It is not difficult to explain why this patient was incontinent. The man was completely paralyzed and quite unable to speak. It was impossible for him to ask for aid when his bladder was full. The problem rather lies in understanding the relatively normal behavior of the bladder. It must be borne in mind that the cortico-efferent fibers controlling the bladder may remain normal even though other groups of cortico-efferent fibers are injured. Another theoretical explanation suggests that the reflex arcs controlling the bladder were also damaged on the sensory side.

(4) *Hemiplegia with Signs of Bilateral Cerebral Lesions.*—Two patients showed evidence of hemiplegia; in addition there were signs of brain injury manifest upon the other side of the body. One with a left hemiplegia had evidence of a right hemianopsia. The other with a left hemiplegia showed rigidity and tremor of the right extremities, suggesting a parkinsonian syndrome due to injury of the basal ganglia or their connections. The first of these patients had a bladder of 150 c. c. capacity, the second 50 c. c. They both showed hyperactivity of the stretch reflex, small vesical volume, and inability voluntarily to control the contraction waves.

(5) *Patients with Hemiplegia.*—A hemiplegia was demonstrated in three patients without manifest signs of bilateral cerebral lesions. In all these three cases the symptoms of mental deterioration were mild. In two cases the vesical capacity was 100 c. c. and in the other 200 c. c. The patient with the vesical volume of 200 c. c. showed signs of early tabes with a superimposed hemiplegia. It has been demonstrated that injury of the cortico-efferent pathway on one side leads to hyperactivity of the vesical muscle and small vesical volume (Lewis, Langworthy and Dees,[4] 1935). Incontinence may be a marked feature due to the decrease of voluntary control of the contraction waves.

(6) *Diffuse Cerebral Lesions.*—In this group there were few positive neurological signs suggesting involvement of the efferent pathways from the cerebral cortex or of lower reflex arcs in the nervous system. Three showed marked personality deficits; the other two moderate mental changes. Two were unable to walk. Bilateral positive Hoffmann reflexes were obtained from four. In no case was the Babinski reflex decidedly positive, although it was doubtful positive upon one side in two. One bladder contracted strongly when empty; the capacity in all cases was 200 c.c. or less. Two cases are cited as examples.

Case 5.—C. K., colored male, 61 years old was admitted because of decreased vision and poor memory. There had been severe pains in the legs for fifteen years. The pupils were unequal and fixed to light. Bilateral optic atrophy was present. The Wassermann reaction was positive in the blood and spinal fluid. The patient voided continually on the floor of the ward, and wet his feet with urine. He did not seem to notice this. Neurological examination revealed positive Hoffman reflexes bilaterally. The Babinski reflex was suggestive positive on the right and negative on the left. The diagnosis was paresis with mental deterioration and primary optic atrophy.

The graphic record of the bladder showed marked hyperactivity of the stretch response. After the circuit was complete and before the introduction of any fluid a sustained contraction of the muscle carried the pressure to 50 cm. The pressure then fell to a resting level of 13 cm. Following the introduction of 50 c.c. of fluid the pressure rose to 70 cm. and the bladder emptied.

Case 6.—The second patient, W. G., was a white man, 80 years of age, who was able to give no history. He coughed constantly and was incontinent of urine and feces during examination. There was moderate mental deterioration. Bilateral Hoffman reflexes were present. The knee and ankle jerks were normally active. There were no Babinski reflexes and no ankle clonus. The diagnosis was arteriosclerosis with diffuse cerebral changes.

The record of bladder behavior is shown in *Fig. 5.* When the circuit was opened, the resting intravesical pressure was 8 cm. Fluctuations of the pressure occurred. Before any fluid was introduced a powerful contraction of the vesical muscle raised the pressure to 110 cm. The catheter was ejected from the urethra.

The bladders of this group of patients were of abnormally small volume and showed hyperactivity in response to stretch. The first exam-

Fig. 5

ple was a man with paresis who was not responsive to the demands of nature because of the marked mental deficit. In addition there are indications from the graphic record that the efferent pathways from the cortex which control the bladder were injured. The second case with no evidence in striated muscle of loss of control from the cerebral cortex showed evidence in the smooth muscle of the bladder of loss of this cerebral influence.

SUMMARY

This study demonstrates that injury to the central nervous system is the common explanation for incontinence in elderly individuals in a chronic hospital. Indeed all the twenty-one cases described here showed nervous system involvement without evidence of important local abnormalities in the urinary system. A considerable group of these individuals had lesions which could be localized in the spinal cord, brain stem or internal capsule. In most cases the changes were bilateral. In the remainder there was diffuse cerebral damage with no changes in the striated muscle or in the reflexes which are considered characteristic of involvement of the cortico-efferent pathways. In these patients the lesion must involve the highest correlation centers controlling vesical activity.

A patient with changes in striated muscle characteristic of damage to the cortico-efferent pathways bilaterally, presented a fairly normal vesical reading. From the data presented in this paper it is demonstrated that bladder abnormalities may be produced by cerebral cortical lesions without abnormalities of striated muscle, and conversely the changes in striated muscle may be present without marked abnormalities in the graphic record. Even so, in all the cases showing striated muscle changes of marked degree, incontinence was present.

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A TUBE FOR THE REMOVAL OF OPEN SAFETY PINS FROM THE TRACHEA AND ESOPHAGUS*

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Baltimore, Maryland

In 1915 Mosher[1] first introduced a tube with a slot for the removal of open safety pins. This was modified by Jackson[2 3] in 1924, when he presented the trap door scope.

The tube to be presented is a modification of the trap door model. The slot is widened and opposite to the slot is a small notch, the walls of which are rounded smooth and are protected by the overhanging light tube, so that no points are presented in the forward end. The forceps used are the Tucker tack forceps or the rotation forceps.

In removing open safety pins, point up, from

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the esophagus or trachea, the tube is advanced until the point shaft of the pin is visible, which is usually at a 45 to 60 degree angle to the lumen of the trachea or esophagus. The point shaft is grasped by the tack forceps, and the pin pushed down to disengage the point end. The tube is rotated so that the handle of the scope is to the keeper side. The slot is opened. On advancing the tube, the point shaft is fixed by the notch and the lower end of the slot. Further advancing of the tube turns the point shaft through the slot into the lumen of the tube and the firm grasp of the forceps. The trap door is closed and the pin, tube and forceps removed together. Straight pins that are angulated can also be turned into the tube by this method.

When using rotation forceps the spring is grasped and the tube advanced, which turns the point end in. The trap door is closed and the pin removed with the tube. The above maneuvers are aided greatly by the use of a double plane fluoroscope, which simplifies the grasping of the point shaft. General anesthesia is used by us.

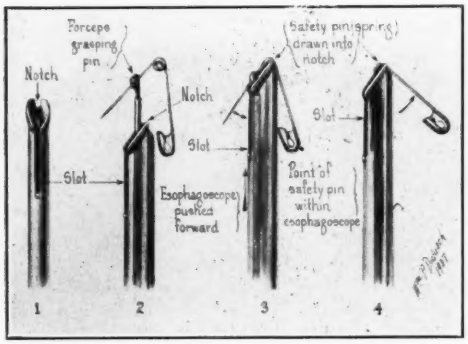

Fig. 1. Illustration of the modified Mosher-Jackson slotted tube shown with the notch opposite to the slot.

Fig. 2. Tucker tack forceps grasping the point shaft of the pin.

Fig. 3. The tube is advanced, engaging the point shaft in the notch and lower portion of the slot. With small pins, the spring is in the tube as illustrated, while with larger pins the spring is outside the tube notch.

Fig. 4. The forcep blades acting as fulcrum have turned the point shaft through the slot into the lumen of the tube. The trap door is now closed and the pin, forceps and tube removed together.

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ROENTGEN THERAPY IN SKIN CANCER*

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Shreveport, Louisiana

The statement was recently made by a well-known dermatologist that of all dermatologic disease entities, tumors of the skin were the most satisfactory to deal with. This is true if we add: "When the case is seen early and when treatment is sufficiently severe to destroy all of the tumor cells." It is probable that no more difficult problem is ever encountered than that presented by an advanced cancer of the face which has already invaded cartilage and bone or which has been made the victim of insufficient treatment.

Early cancer of the skin is a condition in which the tumor growth is plainly visible, well circumscribed, and delineated. In this stage of the disease one should expect 100 per cent cure. Whosoever is unable to secure 95 per cent or better should change his method of treatment. Sutton very wisely states that any person who dies of primary skin cancer has been treated incorrectly, either through his neglecting himself, or through incorrect treatment when he has come for help.

Cancer of the skin may arise from (1) surface epidermis, (2) hair follicle, fat gland, sweat gland, nail bed, and (3) anomalous proliferation. The most frequent histologic types are (1) basal cell carcinoma, (2) basal cell adenoid cystic carcinoma, (3) squamous cell carcinoma, (4) spindle cell carcinoma. An analysis of 1,011 skin cancers treated by me reveals that 509 were basal cell, 41 adenoid cystic basal cell, 427 squamous cell, 31 mixed basal and squamous cell, 4 spindle cell.

The diagnosis of cancer of the skin usually presents no clinical difficulties and will not be considered in this paper. A biopsy should always be done for study. Lesions occurring on the temple are usually squamous cell; on the ear, almost always squamous cell; on the inner canthus and eyelids, basal cell; on the forehead, nasolabial fold and nose, usually basal cell. Lesions on the cheeks may be either basal or squamous cell cancer. Cancer on the hand is always squamous cell. Cancer occurring on

*Read in Section on Radiology, Southern Medical Association, Thirtieth Annual Meeting, Baltimore, Maryland, November 17-20, 1936.

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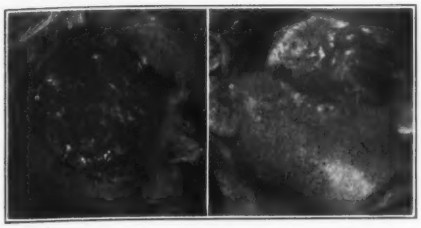

Fig. 1

Case Cl. 137. Basal cell carcinoma of temple and outer canthus of eye. Hyperintensive plan of low voltage roentgen therapy, 1,250 r administered at weekly intervals three times, a total of 4,750 r. There was complete healing four months following treatment.

the vermillion border or mucosa of the lip is always squamous cell.

In the treatment of cancer of the skin, the superiority of radiation therapy cannot be denied. Radiation destroys the cancer cells *in situ*, leaving the normal tissues unharmed. There is very little scar formation or deformity following radiation treatment, provided the lesion itself has not already destroyed normal tissues. Surgery, electrocoagulation and escharotics all destroy normal tissues along with cancer cells. Radiation therapy does not require hospitalization or loss of time.

As a source of radiant energy, x-rays are readily available and at a cost within the purse of every patient. Properly applied, they are capable of taking care of almost all skin cancers. The writer cannot agree with Hayes E. Martin that x-rays are not efficient in the treatment of deeply infiltrating lesions of the skin or growths of irregular contours. It must be agreed at the outset that there are many different technics of x-ray treatment of skin cancer, each of which is capable of producing good results. However, there is one requirement which must be exacted, whatever the technic used, and that is that the dosage must be adequate to destroy all the tumor cells.

This paper deals solely with roentgen rays. The value of radium is fully recognized and radium is frequently used by the author in the treatment of cancer of the skin. A combination of electric cautery or coagulation with x-ray treatment is to be discouraged. Coagulation or cautery leaves a bed of devitalized tissue which requires many weeks or sometimes months to heal.

X-RAY DOSAGE

It is imperative that adequate radiation dosage, carefully measured, be given to secure the best results. Today x-ray dosage can be readily determined and recorded, so that anyone may easily duplicate a method. The well-known formula as advocated by Remer, Witherbee and MacKee for an erythema dose was:

$$\frac{\text{3 S. G. x 3 ma. x 5 minutes} \ldots 45}{\text{8 in. x 8 in.} \ldots 64}$$

This formula has served well its purpose for estimating low voltage x-ray dosage. Today we turn to the more modern method of determining dosage; that is, the roentgen and half value layer. The measurement can easily be made with the thimble type of roentgen meter and is accurate enough for all practical use. It certainly avoids many factors which entered into the MacKee formula and which made duplication of results impossible. These are: thickness of glass wall of x-ray tube, wave form, altitude, size of spark points, and so on. The roentgen is independent of all of these. Andrews and Braestrup found that 400 roentgens measured in air are equivalent to an erythema dose. Investigations made by me in several x-ray laboratories tend to confirm these findings. I found that 350 to 400 roentgens represented the old 45/64 formula as used before roentgen readings were possible. Many radiologists are reluctant to express superficial therapy dosage in terms of roentgen units, claiming that there is too much variance in dosage for different kilovoltage. This, I am unwilling to accept as true.

In the classification of cancers of the skin it has been customary to regard the basal cell type as the most radiosensitive; the adenoid cystic basal cell type as slightly more resistant, and the squamous as radioresistant. There is considerable opinion in favor of the view that the reason why basal cell cancers respond to irradiation more favorably than do those of the squa-

Fig. 2

Case Cl. 1319. Adenoid cystic basal cell carcinoma of cheek, treated with hyperintensive plan of low voltage roentgen therapy, 1,250 r at weekly intervals five times, a total of 7,250 r.

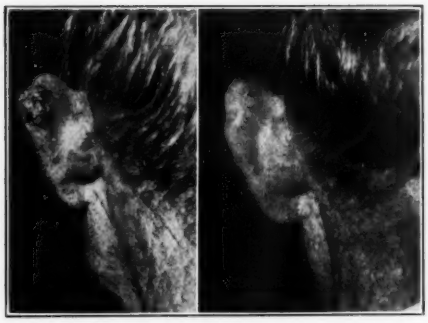

Fig. 3
Case Cl. 1965. Squamous cell carcinoma of ear, treated with hyperintensive plan of roentgen therapy. 1,250 r at weekly intervals, a total of 4,750 r.

mous cell variety is that basal cell lesions are usually small and do not infiltrate so deeply as squamous cell cancers, and also that basal cell cancers never metastasize to distant lymph nodes. The adenoid cystic type of basal cell cancer is frequently found with full malignant features and distant metastasis. Many dermatologists of high standing continue to hold that squamous cell cancer is radioresistant, and to regard it as a surgical problem.

It is my belief, after studying more than one thousand skin cancers of all histological types, that there is no difference between them in cellular radiosensitivity. The basal cell, adenoid cystic basal cell and squamous cell cancers all require about the same amount of radiation for complete destruction when the tumors are otherwise similar. Whatever difference of response is noted in the different types has been due to tumor characteristics other than those found in the cell itself.

What is adequate dosage in the treatment of cancer of the skin? Witherbee and Remer advised 1¼ to 2½ skin units unfiltered, which may be repeated when the erythema has disappeared, but never repeated when erythema is present. In treatment of epithelioma of the lower lip, 2 skin units were advised. Hazen says the dosage should be from 2 to 2½ or even 3 units, and that the treatment may be repeated after the erythema has subsided. Hazen speaks very discouragingly regarding radiation treatment of squamous cell carcinoma, and surely his statistics are not encouraging. He recommends 2 to 3 units, but is strongly in favor of some form of surgical eradication. MacKee advises for basal cell cancers the use of hyperintensive x-ray treatments, to be continued at 6 or 8 week intervals until the case is clinically cured. His advice for squamous cell cancers is essentially the same as for basal cell cancers; in a more recent publication he says: "In certain instances scalpel surgery can be employed to advantage, while in others the best results are obtained with radium or roentgen radiation." Sutton, Stelwagon and Ormsby all advocate methods other than radiation in the treatment of skin cancer, while Sutton states his preference for surgery in cancer of the lip. Neither time nor space will permit a full review of this subject, and only a few outstanding authors are cited. An analysis of the dosages as advocated by these writers soon explains the cause of many failures as inadequate dosage.

The radiologist has long been a champion of massive x-ray dosage in the treatment of skin cancer. Pusey, some twenty-five years ago, was the first to make use of intensive x-ray dosage. Soon thereafter Martin, of Dallas, developed his plan of intensive treatment. Evans and Leucutia, in 1928, published their results with massive and hypermassive radiation in the treatment of skin cancers. During 1932 Widman published his results obtained from use of massive doses of unfiltered roentgen rays.

The writer, after several years of experimenting with x-ray dosage in skin cancer, adopted, in 1931, a plan of hyperintensive low voltage x-ray treatment. The following is, in general, the technic: 100 peak kilovolts, pulsating current, half value layer 0.6 mm. aluminum, 40 cm. focal skin distance, no filter, 1,250 r administered at weekly intervals three times to all histological types of skin cancer. In the event that the lesion is very bulky, that is, shows marked hypertrophic characteristics, or has in-

Fig. 4
Case Cl. 579. Squamous cell carcinoma of lower lip, without demonstrable metastasis. Patient treated with 1,250 r to lip area at weekly intervals three times, totaling 4,750 r.

Fig. 5

Case Cl. 64. Squamous cell carcinoma of nose, treated with 1,250 r unfiltered hyperintensive plan of roentgen therapy at weekly intervals three times, a total of 4,750 r. Note that this patient has many precancerous areas scattered over face and in the photograph showing cure. The patient now has squamous cell carcinoma of conjunctiva. The conjunctiva carcinoma was later treated with beta rays of radium, effecting a complete cure.

filtrated deeply. Four such treatments and in some instances five are administered, so that a minimum of 3,750 to a maximum of 6,250 r. are delivered. It is estimated that by the end of each week the skin will have recovered approximately 70 per cent, whereas the dosage to the tumor cells will be cumulative; on this basis the cancer cells will receive a minimum of ten erythema doses. The splendid work of Martin and Quimby indicates this dosage to be the minimum requirement if squamous cell cancer is to be destroyed. The massive dose technic requires full knowledge of the science of radiology in addition to considerable fortitude. It is not a technic for the novice.

There is little doubt that the hyperintensive type of roentgen therapy represents today the best plan of attack in the treatment of skin cancer. Radiologists agree that this method gives the highest percentage of cures. A careful study of my series of cases treated during the past six years permits me to say that in no case of a basal or squamous cell cancer clinically localized and not larger than 4 cm. in diameter did the hyperintensive plan of treatment fail to produce a clinical cure.

The most frequent cause of recurrence following the massive method of treatment is shielding the lesion too closely. Many authors advise shielding as closely as ¼ inch. This I am certain is too close. Not less than one-half inch of healthy skin should be included in the irradiated field, and in some instances even more. Furthermore, the shield should be so fixed that it will remain securely in place during treatment.

Following hyperintensive treatment, proper attention must be given to the skin and tumor. This is of major importance. A bland soap freely applied and abundance of warm water should be used twice a day and the lesion should be covered with vaseline strips. Poor skin care will unquestionably delay healing. Usually a severe skin reaction will be evidenced by the

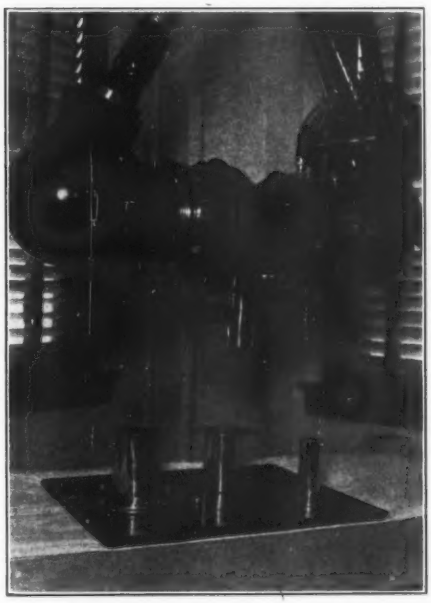

Fig. 6-A

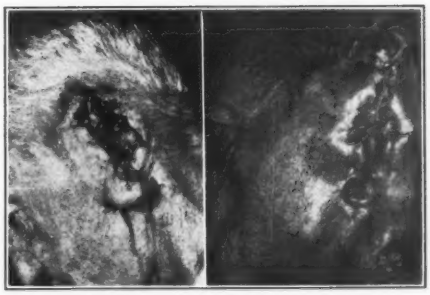

Fig. 6-B Fig. 6-C

Case Cl. 2414. Fig. 6-A shows oil-immersed shock-proof head with set of special 25 cm. cones used in treating skin carcinoma. Fig. 6-B shows condition of patient when admitted to clinic. Biopsy revealed squamous cell carcinoma. This patient had been treated on numerous occasions elsewhere with x-rays, cancer paste and cautery. Using a Thoraeus filter No. 1 and high voltage x-rays, 200 r administered daily until 4,000 r were received. Fig. 6-C reveals condition of patient three months later, the lesion having completely healed.

time the third treatment is due, and about four weeks after the final treatment the skin changes will begin to subside. In most instances there should be complete regression of the tumor and healing of the skin by the tenth to the twelfth week. When the tumor has destroyed an area of skin more than 3 or 4 cm. in diameter, it is well to use small point skin grafts as soon as the tumor bed will permit. Once the skin has completely healed, the patient should be cautioned to avoid strong sunlight or any trauma to the delicate new skin.

HIGH VOLTAGE THERAPY IN SKIN CANCER

The treatment of cancer of the skin which has been previously and unsuccessfully treated with radium or low voltage x-rays is indeed a difficult problem for the cancer therapist. It is generally believed that many failures are due to inadequate dosage and that radioresistance in skin cancer can be coped with. Merritt and Rathbone, in 1935, reported their experience with the use of 220 PKV. x-rays, Thoraeus filter No. 1 (0.4 mm. tin, 0.25 mm. copper, 0.1 mm. aluminum) at 25 cm. distance. Some time prior to this report the writer began to make use of high voltage therapy, using a Thoraeus filter No. 1, in the treatment of certain skin cancers. This type of treatment has been confined to "failures," cases which had been treated elsewhere or by myself and which still showed active cancer.

At first 50 cm. focal skin distance was used, but more recently 25 cm. distance has been adopted. Operating at 200 PKV., 20 ma., Thoraeus filter No. 1, half value layer 1.4 mm. Cu. 60 r. are delivered from an oil-immersed shockproof flexible tube head. This short distance is possible only when an oil-immersed tube head is used. Operating at this set-up, 200 r. are given daily until a maximum total of 4,000 to 8,000 r. are administered. The results obtained thus far certainly convince me that there is a place for this type of roentgen therapy, but because of economic reasons it should be reserved for failures or cases which at the outset indicate deep infiltration involving bone or cartilage.

SUMMARY

The writer discards the idea of difference in radiosensitivity between basal and squamous cell cancers of the skin, insofar as this is based on strictly histologic grounds. A hyperintensive low voltage method of x-ray therapy is described, which delivers a minimum of 10 erythema doses to the cancer cells. In clinically localized cancers not larger than 4 cm. in diameter this method has resulted in clinical cure in 100 per cent of cases in his experience. High voltage therapy with Thoraeus filter No. 1 is desirable in cancers which have proven failures under other treatment.

DISCUSSION (*Abstract*)

Dr. J. M. Martin, Dallas, Tex.—I have reviewed with a good deal of interest Dr. Edwards' paper, and I agree in the main with what he has said. I particularly want to stress his statements dealing with inadequate dosage in x-ray treatment of skin cancer. A good deal has been said and written in the past by some of the authors mentioned about the skin dose or skin unit. The dose estimation in skin units has been so inadequate that, if followed, little or no good would be accomplished. Two and a half skin units are supposed to produce a mild erythema on the most susceptible skin, a dose that is negligible in the treatment of cancer. This method of dose estimation is responsible for a great deal of the poor x-ray therapy in the treatment of cancer in this country. It has been definitely ascertained that seven to ten erythema doses of x-rays are necessary to destroy squamous cell cancer, therefore the skin dose or a multiple of them so frequently advocated is manifestly too small in all but the mildest cases of cancer. When a physician sees a patient in extreme pain, he does not think of giving him 1/100 of a grain of morphine with the hope of relieving him. Instead, he would probably give him fifty times that amount. When firemen are called to a blaze they do not throw a quarter-inch stream of water on the fire, but they endeavor to deluge the burning mass as quickly as possible.

A malignant growth should receive that amount of radiation in a single series of exposures that will in the judgment of the radiologist destroy all of the cancer cells, without doing irreparable injury to the surrounding normal tissues.

Dr. Edwards is using a massive dose technic somewhat different from the one I use in the treatment of skin cancer. If he and his patients are satisfied with the curative and cosmetic results obtained, he should continue to work with the technic with which he is acquainted. There are a number of roads leading to Baltimore. Some are shorter and some are better than others, but they all bring you here. The end results are what count.

In the treatment of skin cancer by x-rays, I seldom pay any particular attention to the grade of the growth or the so-called radiosensitivity of the cancer cells. Squamous cell carcinoma of the lower lip responds as promptly to a properly applied dose of x-rays as does basal cell cancer on the cheek and forehead. The thing most important is the size of the growth and the amount of induration present. A hard nodular growth will require more intensive radiation than a flat, slightly indurated lesion.

I seldom use electrothermic coagulation in the treatment of skin cancer, except for the removal of large

fungating masses where bleeding is a troublesome factor. In hard nodular tumors where a limited amount of scarring is not objectionable, the time of the treatment and the amount of radiation used may be shortened by cutting away the tumor mass with the radio knife.

Dr. Edwards is only partly right when he says that "the radiologist has long been a champion of massive doses in the treatment of skin cancer." Only a small per cent of the radiologists in this country are using a reliable radiation technic in the treatment of skin cancer.

Last year at St. Louis I said that not more than 50 per cent of the cancer cases treated by radiation in this country are being properly treated. Today, one year later, I see no reason why I should change that opinion.

Dr. Fred M. Hodges, Richmond, Va.—In only a very few diseases in the entire field of medicine today is it possible to obtain results comparable to those obtained by many experienced roentgen therapists in the treatment of skin cancer.

In spite of this fact we are constantly seeing very advanced or hopeless cases, the majority of which have already been treated, but inadequately, and at a time when proper treatment would almost certainly have produced a cure.

Almost all of the poor results today in the treatment of skin cancer are due, I believe, to the following errors in dosage, technic and judgment:

(1) Most important is insufficient dosage.

We use from 5,000 to 15,000 r., or more, dependent largely on the size, location and clinical characteristics of the growth in addition to its type and grading.

Many basal cell lesions also contain squamous cells, and many cells which should from the microscopic grading be radiosensitive are either very radioresistant or other radioresistant cells which did not happen to be in the particular tissue examined are present.

Therefore where an escharotic dose is possible little attention, except for record, should be paid to the microscopic grading and typing in skin cancer. Give all of them "the works."

(2) Faulty application of rays in shielding too closely and not properly arranging lesion and tube so that all of the lesion is hit by the rays. This applies particulary to lesions around the eyes, ears and lips.

(3) The use of unfiltered low voltage rays in very large growths, and those which involve periosteum, bone or cartilage except of course very small lesions on the ear or nose.

High voltage, heavily filtered rays applied over several weeks' time certainly produce better results in these cases. We have not been able to demonstrate any definite difference in the response of these lesions to 200 or 400 kv.

We do feel, however, that wherever large areas must be treated the equivalent of 5 mm. of copper or more is an advantage.

To diverge somewhat, this section should be very proud of the fact that the highly satisfactory status of roentgen therapy in skin cancer in this country is due in no small part to the efforts of two of its members, Dr. Martin and Dr. Merritt.

DIAGNOSIS AND TREATMENT OF NEOPLASMS OF THE SKIN*

By ROBERT L. KELLY, M.D.
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Benign neoplasms of the skin are important from two points of view: first, because of their variety and high incidence; and second, because in their case the designation benign is not wholly satisfactory from the clinical standpoint. The site exerts a qualifying influence. The same tumor which, protected within the body, would remain harmless to its bearer, may take a dangerous course, with ulceration, infection or hemorrhage threatening life, or with malignant degeneration when it is exposed to the traumatism and irritation which the tegument must normally sustain. One would do wrong, furthermore, to ignore the interference which an otherwise harmless growth can exert in what one may term the psychic function of the face, the function of expressing personality. From all of these standpoints, serious attention is warranted to benign as well as to malignant neoplasms of the skin.

As a rule, there is no great difficulty in recognizing and differentiating benign cutaneous neoplasms. Having attained full development after a slow growth, they remain quiescent in the absence of complications due to injury, with the exception that some varieties may undergo spontaneous involution. Renewal of growth is a warning of the onset of malignant change.

The breadth of my subject allows time for only brief review of the more common of the benign tumors of the skin before I pass on to the malignant growths.

Fibroma appearing singly may be hard or soft. The soft variety may be pendulous, rounded or pear-shaped with a thin pedicle. In size it varies from a pea to a hen's egg. The overlying skin is normal in appearance. The small sac of wrinkled skin sometimes seen in persons of advanced age marks the site of a partially absorbed fibroma of this sort. A hard fibroma is a firm, smooth, deeply imbedded nodule. It may be as small as shot, or considerably larger, up to a centimeter in diameter. The color, at first pink, turns later to red or brown and still later to ivory. Several of these tumors may be present. Treatment of solitary

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fibromas of the skin, if indicated, is by surgical excision. The multiple tumors of neurofibromatosis (von Recklinghausen's disease) arise from the perineurium or interstitial tissue of peripheral nerves. They are irregularly distributed and irregular in size. Some are no larger than a pea and can be pressed back into the skin, while others, pedunculated, will weigh several pounds. Pigmentation is a usual accompaniment. Other kinds of tumors may be present, and mental weakness is not unusual. Altogether the picture is distinctive. There is no known treatment of the disease.

Keloid is a neoplasm of the derma, which, though it may arise spontaneously, usually follows trauma, developing in the scar. It appears as an elevated band or plaque, single or multiple. The shape is often bizarre, the surface is smooth or corrugated, dirty white or reddish, and, when older, tense and glistening in appearance and traversed by small telangiectasias. There are occasional subjective symptoms, such as burning, and sensitiveness to pressure or to heat. Keloid responds to either x-ray or radium. For a thin flat keloid, suberythema doses may be given unfiltered, for thicker growths, filtration through one to three millimeters of aluminum is advisable. Old, hard keloids are best treated by a combination of surgery and irradiation.

Myoma of the skin is rare. It may appear as leiomyoma, multiple, firm, reddish or brownish, small roundish nodules, which may be painful when fully developed; or as single subcutaneous tumor of the breast or genitals, without subjective symptoms. The former variety may be treated by electrocoagulation or carbon dioxide snow, the latter by surgery.

Lipoma arises in the subcutaneous tissue of the neck, shoulder or back, more rarely on the face. It may appear singly or in diffuse masses. It is a broad based tumor, and may be flat if small, but is likely to be lobulated when it develops to a larger size. The overlying skin is normal. It should be noted that large lipomas may be present when the patient is in a state of emaciation, since they are independent of the general nutrition. Treatment is surgical.

Neuroma is a rare tumor which appears multiply on the shoulders, arms, thighs, or buttocks chiefly of middle-aged men. In size it varies from a pinhead to a walnut. It is dense, elastic, purplish, and fixed firmly in the corium and underlying tissue. The skin over the tumors is desquamative. When fully developed these tumors give rise to paroxysms of intense pain, excited or made worse by emotional upsets or changes in the weather. The nodules are not located along nerve courses. Surgical removal should be followed by irradiation in intensive doses, filtered, to prevent recurrence.

Osteoma of the skin is rarely spontaneous, but develops secondary to trauma or irritation, as in hod carriers, or to syphilis or tuberculosis. It may be single or multiple. Treatment is surgical.

Cutaneous endothelioma is a rare tumor found on the scalp, face, back or chest. It may be single or multiple, red or violaceous, from a pea to an orange in size. Microscopic examination may be necessary for diagnosis. Treatment is by radium or by surgery followed by irradiation.

A case of syringocystadenoma, taking origin from the sweat glands, is recorded by Sutton.[1] This relatively rare condition presents numerous nodules, from a pinhead to a pea in size, compressible, yellowish, brown or pink, moving freely over fascia but fixed in the skin. They are usually only slightly elevated, but in Sutton's case the lesions were larger and more distinctly raised. The usual treatment is electrocoagulation.

"Birthmarks" are serious matters from the standpoint of economic and social opportunity, and are hence worthy of the dermatologist's most serious efforts. Extensive flat nevus is difficult to remove or improve. There is difference of opinion as to the advisability of using radium on port-wine stains in the hope of reducing the intensity of the vinous hue. The Kromayer light compression therapy is said to achieve good results in some cases. Kromayer[2] divides birthmarks into three classes: (1) arterial nevi, bright red, which he treats with blue light compression irradiation; (2) superficial capillary nevi, red or blue, not raised, smooth or, if the papillary body hypertrophies, raised and rough or nodular, to be treated with the light therapy followed by radium to destroy the deeper parts; (3) venous birthmarks which may extend outward till they lie as red or blue nodules directly beneath the epidermis, where they are subject to severe hemorrhage on slight traumatism. The cavernous hemangioma may appear as a monstrous blood sponge, affecting an elephantiasic change in the lip, nose or half of the face, the color determined by whichever system, venous or arterial, predominates. Radium is the treatment of choice for most tuberose angiomas. If large and pendulous, so that surgery is felt to be indicated, the tumor should still be treated with radium to reduce its size. Combined needling and contact application is recommended for particularly large

cavernous hemangiomas. The cosmetic results in radium treatment of tuberose angiomas covering half the face have been remarkable. It is explained that radium exerts a degenerative action on the vascular endothelium, so that there is no thrombosis and subcutaneous scar formation. Baensch[3] warns against spacing radium treatments too close together, to avoid too great shrinkage, and advises that treatment be stopped before complete symmetry is attained, because of the shrinkage which will continue. For cavernous nevi Bertwistle[4] recommends injections of quinine urethane.

Most moles are essentially benign. This includes non-pigmented moles, which are, in fact, fibroma, and the hairy pigmented, the raised brown and the verrucous brown mole. Benign moles may be treated with electrolytic destruction of the hairs, if any are present, and removal of the remainder of the mole by carbon dioxide snow, trichloracetic acid or electrodesiccation. Pigmented moles should not be exposed to radium or x-rays. The mole that is a potential melanocarcinoma is, according to Eller and Rein,[5] slate black or bluish black, flat or but slightly elevated, and usually non-hairy. Butterworth and Klauder[6] describe the moles which are liable to prove the source of malignant melanomas as

"soft nevi, pigmented spots of varying size or nodular warts, pedunculated papillary lesions that are soft and often wrinkled like raisins, or linear or diffuse."

Such moles should be let alone unless they are on sites exposed to irritation or unless they show the earliest signs of change, when they should be removed by wide excision by means of the high frequency knife. The mole should not be manipulated, but removed with surrounding muscle and fascia. Gamma irradiation should be applied immediately to the wound area and to the regional lymph nodes. Anderson and Simpson[7] describe a method of desiccation followed by curettage, which has apparently given good results in their hands. These authors mention a type of melanotic lesion which starts as a pinpoint lesion in the pre-cancer age and is commonly mistaken for a comedone and squeezed. They insist, furthermore, that the prognosis of developed melanocarcinoma and melanosarcoma is not so hopeless as it was fifteen years ago and recommend hypermassive roentgen therapy. Handley[8] suggests excision, including a band of deep fascia containing the trunk lymphatics, together with a circular area of deep fascia surrounding them and likely to be permeated, lymph nodes, and so on, in one piece and thinks results should be as good as those in breast cancer, provided dissemination by the blood stream has not taken place.

Epithelioma may be benign or malignant. Geschickter and Koehler[9] have reported on 1,505 cases, comprising 545 benign and 960 malignant. The total number was divided approximately equally between basal cell and squamous cell tumor. Of the basal cell tumors 220 were benign, 535 malignant. Of the squamous cell tumors 325 were benign, 425 malignant. Benign epitheliomas predominated over malignant on the trunk and extremities. On the head malignant epitheliomas predominated over benign almost three to one. Basal cell epitheliomas were the more frequent on the face, eyelids and nose; squamous cell about the ear and on the extremities. The papillomatous and the subepidermal varieties of basal cell tumor were found in both the benign and the malignant groups.

There is a type of benign epithelioma of the scalp, which occurs multiply, and is known as turban tumors, or, in Europe, cylindroma. It is thought to arise from the epithelium of the sebaceous glands. These tumors appear in youth and grow slowly, reaching full development after middle age. The tumors are pea to cherry size, white, pink, or purplish blue. The smaller nodules are solid, the larger ones soft. They are said to respond slowly to radium, but to be most satisfactorily treated by excision. Related to turban tumors are adenoma sebaceum and epithelioma adenoides cysticum.

There are two forms of keratosis, each form common, in which epitheliomatous degeneration may take place. In senile wart or seborrheic keratosis malignant degeneration does not take place spontaneously, but only as the reaction to prolonged irritation. There are three varieties of senile warts or seborrheic keratosis, one with smooth surface resembling a pigmented nevus, a more common variety with fatty squames easily scraped off, and a verrucous or hyperkeratotic variety. Senile keratosis, or keratoma, gives rise to cancer in a higher percentage of cases and is regarded as definitely precancerous. Senile keratosis is a flat or raised, brownish or gray lesion, covered with squames which are firmly adherent. Seborrheic keratoses are found multiply and mostly on the seborrheic regions of the trunk, in the sweat channels; while senile keratoses may be single or multiple and develop chiefly on the exposed skin. Senile keratoma may remain quiescent for years and then suddenly begin to grow and strike into the deeper tissues. In the precancerous stage it is curable by irradiation

in 100 per cent of cases. Weeping in a keratosis is an indication for biopsy. Rodent ulcer may begin in a keratosis or in a benign subepidermal epitheliomatous nodule. Geschickter and Koehler state that the more highly differentiated and low types of squamous cell cancer usually begin in keratoses or benign warts, and that the more undifferentiated and highly malignant squamous cell cancers are prone to appear where no previous skin lesion was observed, the first warning being slight ulceration.

Clear and detailed descriptions of the early stages of basal cell and squamous cell cancers of the skin have been given by Magnusson.[10] The basal cell cancer in its earliest stages is described as a superficial nodule of waxy, semitranslucent appearance. This tumor tends to ulcerate, and it has as a rule a well defined, firm edge, like an embankment, surrounding the ulceration, which is usually covered with a crust. On the temples and over the bridge of the nose, the ulceration may heal at the center, and the tumor then has the appearance of an atrophic skin area surrounded by narrow, winding parapets, interrupted by small crusted ulcerations. In hairy areas the cancer may appear as a clear, granulating field without raised edges and entirely ulcerated. At sites of surface irregularity, as in the angle of the nasal wing or under the lobe of the ear, the cancer may take the form of an ulcerating fissure, surrounded by a firm and sometimes undermined edge. Slow growth and well defined outline are characteristic of basal cell cancers of the skin. Infiltration of the underlying tissues occurs late. In rapidly developing cases "daughter tumors" sometimes appear in the immediate vicinity. They may be joined to the mother tumor by a thin subcutaneous strand. Basal cell cancers rarely metastasize. Magnusson saw no instance of metastasis in some six hundred cases. Squamous cell cancer of the skin in its earliest stages looks like a small area of horny skin or a keratosing papilloma resting on a disc-like induration.

Riehl[11] classifies skin cancer clinically into superficial infiltrating and proliferating-papillary forms. At its earliest appearance the superficial epithelioma resembles milium and is readily overlooked. Gradually the lesion widens out, the center sinks in and a border of hard white nodules or a rim of infiltrate forms. At the center, erosion, crusting and epithelialization may take place, to be followed by renewed breaking down and further advance peripherally. Thus the well-known picture of rodent ulcer develops. For a time it still remains a localized disease, but if neglected the ulcerations strike down and the entire cutis and underlying structures, cartilages, bone, and so on, are included in the destruction. Such a tumor may be very extensive and the disfigurement shocking, its course may have run over ten to fifteen years and still the general health may be unaltered, but if it remains untreated cachexia appears in the end.

The form with early infiltration begins as a hard, painless nodule, freely movable and sharply delimited, covered by skin of normal appearance. It is likely to be first noticed when it is the size of a hempseed or a pea. It enlarges, approaches the surface, breaks down and shows a deep, crater-like ulcer. From this point on, the infiltration and deep involvement follow the course described for rodent ulcer, but the progress is more rapid.

Proliferating papillary cancer develops with massive proliferation of cancer tissues and rapid breaking down. This form is likely to arise on the site of lupus vulgaris or other pathologically altered skin.

Irradiation has today very largely superseded surgery in the treatment of skin cancers. Surgery in combination with radiotherapy is frequently preferred in squamous cell cancer, and in large basal cell cancers with highly irregular surface it is often advisable to remove the projecting portions of the growth by surgery to avoid the systemic effects of absorption of such large masses of broken down tissue. Each tumor must be treated with regard to the peculiarities of its site and clinical course as well as with regard to its histologic structure. Surgical diathermy has proven a very useful adjunct in the treatment of skin cancers, especially for removing large, fungoid masses. According to the individual tumor, the choice may be made between x-ray and radium. Radium possesses certain advantages for a field of such varying contours and small individual planes as the face, in that it permits concentration of the rays in small areas. Radium offers a wide variety of technics, which allows a nice adaptation to the peculiarities of the site. It may be applied by fitted mold, by surface contact, from a distance and by needling or implantation of seeds. Cross firing can be applied with effectiveness. Cartilage and bone are liable to radionecrosis; hence, cancers of the ear, nose and scalp must be treated with great delicacy of technic. It is particularly necessary that these cancers be treated early, while comparatively light doses will suffice and before the underlying structures have been invaded.

Basal cell cancer is more sensitive to irradiation than is squamous cell cancer, but it must be remembered that many basal cell tumors contain a certain proportion of squamous cells and that to attain success in such cases the dose must be sufficient to destroy these more resistant cells. Radium gives its most striking results in rodent ulcer. With a carefully planned attack with diversified technic extraordinarily large cancers of this shockingly disfiguring variety may be completely and permanently removed. In suitable cases the roentgen ray can give results wholly comparable to those of radium, but as a routine method for the general run of skin cancers, it does not, as ordinarily used, allow such careful guarding against damage to normal tissue or assure so well against recurrence. Advantage is sometimes obtained by using radium and roentgen rays in combination. The soft, caustic rays will suffice for the healing of basal cell cancers that are still superficial; to reach deeper parts filtration is necessary. Squamous cell tumors require the more energetic action obtained through heavier filtration. In treating squamous cell cancers it must be borne in mind that beneath the surface they widen out; the rays must therefore be applied over a wider skin area than that occupied by the visible lesion.

If the regional lymph nodes are involved or if there is suspicion of involvement, it is best to remove them surgically. In squamous cell cancers of Grades I and II this should be sufficient. Cancers of Grades III and IV should be irradiated before excision, or external irradiation may be followed by exposure and implantation of radium.

Sarcoma of the skin is the rarest of the cutaneous malignant neoplasms. It is a round or oval tumor without nodulations. The overlying skin is smooth and shiny; in older cases it may be thickened and scaly. If the tumor takes origin from the subcutaneous tissue, the skin is of normal color; if from the corium, the color of the overlying skin is purple and may verge on black. A rapidly growing spindle-cell sarcoma of globular form may become pedunculated. A round cell sarcoma is liable to early necrosis and hemorrhage. Sarcomas of the skin may remain quiescent for long periods, then suddenly commence to grow and to send forth metastases. The highly cellular varieties are radiosensitive and may be treated with x-rays or radium. The fibrous types require excision, with irradiation applied before and after the operation.

SUMMARY

The skin gives origin to a wide variety of tumors, benign and malignant. Because of their exposure to injury and irritation, benign tumors of the skin are subject to infection, hemorrhage and other accidents, and in some cases to malignant degeneration. Their diagnosis and treatment are worthy of the study of the dermatologist. The more common varieties are discussed from these standpoints. The early stages of cancers of the skin are described as an aid to their histological differentiation and clinical classification. Irradiation with or without surgery or surgical diathermy as adjunct is the treatment of choice in most cases of cutaneous cancer. Radium offers advantages from the side of ready adaptability and in other respects. The prognosis of malignant melanomas appears a little less dark in some recent reports. Sarcoma of the skin, an uncommon tumor, is briefly described.

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DISCUSSION (*Abstract*)

Dr. Lee McCarthy, Washington, D. C.—As Dr. Kelly has said, the best treatment of epithelioma of the skin is early diagnosis. This applies particularly to the majority of the cases referred to us. How often have we been sent a well developed squamous cell tumor of the face, concerning which the patient said: "I showed it to my family doctor last year and he said it was nothing . . . just leave it alone. However, when it started to grow and to ulcerate I thought I had better do something about it." In the majority of such instances a benign basal celled growth or a senile keratosis has been allowed to develop into a much more serious squamous celled type necessitating long treatment and probably causing considerable disfigurement. Once the case is diagnosed, what form of treatment

are we to employ? Complete destruction is our aim in early tumors. We feel that if not too much disfigurement will result therefrom, destruction with coagulation and curettage down to and beyond normal tissue is the method of choice. The method is simple, not costly and no x-ray or radium is necessary if the job is thoroughly done. On the other hand, it is certain that radium needles alone will give better cosmetic and just as good clinical results. In fact, the growth may occur in certain regions where coagulation is not possible. In such instances radium needles or plaques or x-ray must be relied upon. No matter what the advice may be, the treatment should be thoroughly done the first time it is attempted.

The results of treatment are not always what is to be expected. We have had this experience in treating what appeared to be relatively small and benign basal cell tumors, especially on the nose or in the nasal folds. Time and again after what we have considered adequate treatment we have seen repeated recurrences, especially in individuals between 30 and 40 years of age. We have under observation seven such cases which were apparently cured after the newer Coutard treatment only to relapse several months later. What should be done with such cases is a serious problem.

We should like to mention briefly leukoplakia as a precancerous lesion, and its treatment. Practically all observers feel that the treatment of leukoplakia with radium or x-rays does nothing but harm. In fact, the first thing to do is to remove the irritating cause of the leukoplakia. If this is done the ordinary thickened and whitened mucous membrane will gradually return to normal. If verrucous growths or ulceration have already appeared, we feel that the best method of treatment is deep and complete destruction of the lesion with coagulation under good anesthesia.

Another point we should like to bring up is the difficulty experienced in distinguishing between recurrence and the keloidal scar that not infrequently forms in a lesion that has been thoroughly destroyed by fire and then treated by x-rays or radium. We believe that this lesion should be observed for a longer period before undertaking further treatment. We have recently observed such an instance in a lesion of the skin of a young white girl aged 16 years. A small basal cell tumor proven by biopsy was adequately treated by another dermatologist by coagulation and radium and x-ray. Three months later a split-pea sized hard nodule appeared in the center of the healed lesion. Close questioning brought out that this girl had a tendency toward keloid formation in other parts of the body. The lesion was observed for over two years without any further treatment and the nodule in the center has gradually receded to the level of the skin. If further treatment had been undertaken it is feared that disastrous cosmetic results would have resulted.

As Dr. Kelly has said, epitheliomata in the great majority of cases occur in late adult life or in old age. As a great rarity we see basal cell growths in young girls before the age of 21. These tumors in our experience have invariably followed some sort of injury to the skin and they are notoriously difficult to destroy, probably because differentiation into the more resistant form of squamous cell growth takes place earlier in young people.

Dr. Walter Teichmann, Washington, D. C.—For the treatment of cavernous nevi I have a few times used quinine urethane with good results, but I abandoned this form of treatment because of a slough that followed the injection of only two or three drops of this solution, done under sterile technic. The slough was out of all proportions to the minimal quantity injected. The angioma disappeared, but left a crater-like, rather disfiguring scar. For superficial hemangiomata of moderate size, carbon dioxide snow used cautiously so as not to produce ulceration has given me good results with excellent cosmetic appearance.

The most useful classification of epitheliomata for the dermatologist is probably that of Darier. He divides the carcinomata of the skin in three groups:

(1) Primary, which are those appearing in an apparently normal skin.

(2) Secondary, those developing in scar tissues, lupus, radiodermatitis.

(3) Metastatic, which do not concern us here.

The primary carcinomata again he divides into:

(A) Carcinoma spinocellulare, radiosensibility varying, often low, therefore many refractory cases.

(B) Carcinoma basocellulare, radiosensibility high.

(C) Carcinoma spinobasilare stands between both, as far as radiosensibility is concerned.

The secondary carcinomata are little amenable to radiotherapy, because of their poorly vascularized base.

The differentiation for estimation of response to radiation naturally has its limitations. Baensch cites experiences where carcinomata of the same histological structure on the same person show entirely different reaction to the same treatment. Miescher sees little difference in the radiosensibility of the primary groups if the technic is adapted to the individual case. As far as the technic of the radiation is concerned, there is considerable disagreement, first as far as the degree of intensity and filtration is concerned, and secondly whether to give single, massive doses or fractional distribution over a certain period. The latter is really the older method having been suggested by Freund, who still is using it. Lately it has been refined and again popularized by Coutard.

Another new method of radiation is one of Chaoul and Adams, which is adapted only to the epitheliomata seen by the dermatologist. The original method uses special tubes which permit operation at a skin focal distance of 5 cm., but modification permits distance up to 8 cm. 60 kv. 0.2 mm. copper and a radiated field of not more than 15 square cm. Reports with trials of this method are also very encouraging.

Dermatologists, however, appear in the majority of cases to prefer the massive doses wherever possible, combined with endothermic removal.

If the Coutard method has any value at all it certainly should be used to radiate involved regional lymph nodes instead of having them, as Dr. Kelly suggested, surgically removed.

It would not be untimely to investigate the radiation of skin cancer cooperatively by several groups of dermatologists who have large enough clinics at their disposal instead of having this field almost entirely covered by the radiologist.

REPORT OF A CASE OF PAGET'S DISEASE OF BONE, WITH AN ASSOCIATED OPTIC ATROPHY AND A BRIEF REVIEW OF THE LITERATURE*

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It was in 1876 that Sir James Paget presented before the Medico-Churgical Society of London a paper on a form of chronic inflammation of bone with a report of five cases. He named the condition osteitis deformans. The history of the disease as an entity dates from the time when Paget presented his paper. Since then there have been about three hundred of these cases reported.

This case is being presented because it has associated with it a mild degree of optic atrophy, a marked restriction of visual fields and diminution of vision. It is believed that this visual disturbance is produced by bony encroachment upon the optic nerves at the optic foramina and that this is a part of the picture of Paget's disease. This, it seems, is a relatively rare complication, as one finds but a few references in the literature of optic atrophy's being associated with the disease.

Hurwitz found only 3 cases in 30,000 medical admissions to Johns Hopkins Hospital and DeCosta found only 3 cases in 38,000 admissions to the Jefferson Hospital. Males are said to be more frequently affected than females. In a study by Packard and his associates it was found that 67 per cent of them were males. These same workers studied 51 cases and found that the average age of onset was 51 years and that it has been reported in patients as young as 15 years.

The cause of the disease is unknown. Many theories have been advanced as to its causation, none of which have been conclusively proven. Syphilis has been suspected, but the majority of the cases have been entirely free from this disease and antiluetic therapy has not proven beneficial. Some Italians claim to have isolated a diplococcus from a piece of the tibia and to have prepared a vaccine which proved beneficial in treating two cases. Bacteriologic studies have been made by other observers with negative results. Some cases have come to autopsy which have shown certain changes in the cord, medulla and peripheral nerves. This gave rise to a neurogenic theory. Most cases, however, show no changes in the central nervous system. DeCosta, Bergin and Funk believe the disease to be due to a disorder of bone metabolism probably dependent upon the absence or perversion of some internal secretion. They point out that gigantism and acromegaly are associated with a disorder of the pituitary gland. Metabolic studies were conducted by these workers on two patients and they found that they retained calcium, manganese and phosphorus and that there was a pronounced loss of sulphur from the body, whereas the reverse is true to a certain extent of osteomalacia.

The individual affected bones are much enlarged. The long bones are more or less cylindrical and show the process to be evenly distributed throughout the entire shaft. The surface is rough and uneven, but does not show large exostosis. For the most part the bones are soft and cut easily with the knife. It is in this early stage of fibrosis that bowing takes place in the long bones. In the later stage of the disease one will find areas of ivory-like hardness. The narrow space is early encroached upon and is frequently entirely absent. The articular cartilages are as a rule preserved. Caries and necrosis of the diseased bones are seldom present.

Subjectively pain, aching and bowing in the affected bones are the chief symptoms of which the patients complain. Some few patients, however, never complain of pain. There may be a history of having to buy hats larger each season. The course of the disease is slow and it may be quite advanced before the patient's attention is called to the bony changes. Practically every bone in the body is susceptible to the disease, the long bones and the head being the ones most commonly affected. When the long bones are affected there is generally some bowing which accounts for the patient's loss of height. In the head the formina, through which the cranial nerves make their exit through the skull, are reduced in size, hence, when a sensory nerve is encroached upon, the patient will begin to complain of painful symptoms. This may be in the region of the trifacial nerve or in the region of the sphenoidal sinus, where the vidian nerve crosses backward, giving a so-called vidian neuralgia. The patient frequently notices a change in hearing and occasionally in vision when the foramina of the optic and auditory nerves are decreased in size. Paralysis of the facial nerve is quite a common occurrence and several observers have reported drooping of the shoulders when the spinal accessory nerve was encroached

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upon on one or both sides. The final stage of Paget's disease of the head has as its symptomatology that of increased intracranial pressure. This may not occur until after the head has assumed an enormous size, but eventually the inner table becomes involved and fibrosis of the inside occurs. This decreases the size of the cranial cavity and the picture of increased intracranial pressure presents itself. The characteristic finding in these cases is choked discs associated with other cranial nerve involvement.

Dr. George W. Swift has reported a case that showed choked discs and a weakness on one side of the body. A diagnosis of brain tumor was made. At the time of operation for the purpose of reaching the lateral ventricles it was noted that the skull was ¾ of an inch in thickness and as soft as cheese. Hence, the diagnosis of Paget's disease was made and was easily confirmed by the x-ray.

Dr. W. G. Wyllie, of the National Hospital for the Paralyzed and Epileptic at Queen Square, England, has reported two cases of compression of the spinal cord due to involvement of the spine. Laminectomy was performed on these cases and the effect of decompressing the cord was satisfactory for relieving symptoms.

Wyllie has also reported two cases of optic atrophy which were associated with an advanced degree of Paget's disease of the skull. He suggested that this was brought about by pressure on the nerves, thus producing an optic atrophy. Wyllie has studied some museum specimens of patients who died of Paget's disease and noted that the foramina at the base of the skull was not seriously contracted, although the regularity of the margin was impaired. This is most noticeable in the foramen magnum. Some specimens, however, showed a pronounced contraction of their foramina.

Jack has reported the case of a man 46 years of age who complained of severe pain in the head with attacks of fever and weakness and later blurred vision. It was found that this case had an advanced degree of Paget's with actually a necrosis at the vertex of the skull.

Hempleman has reported a case in which the head had been enlarging for ten to twelve years and which had reached enormous size. The lower jaw had enlarged so that the lower teeth articulated ½ inch in front of the upper, while formerly the upper teeth articulated in front of the lower. The left side of the lower jaw was more thickened than the right and the head rested almost on the sternum, which showed an exaggerated anterior curve.

The case that I am reporting is a private case of Dr. C. C. Coleman, of the Department of Neuro-Surgery of the Medical College of Virginia. I feel grateful to Dr. Coleman for allowing me this privilege and for the criticisms offered in the preparation of this paper.

CASE REPORT

The patient, Mr. J. B. S., a white man, aged 67, first consulted Dr. Coleman in 1925. He had at that time as his chief complaint generalized head pain, aching and numbness of the lower extremities, and a marked restriction of his visual fields. At that time a diagnosis of Paget's disease was made. The symptoms slowly grew worse so he consulted Dr. Coleman again on May 12, 1933.

The patient first noticed an enlargement of his right leg in 1925. This enlargement has been progressive and has been accompanied by pain of a dull, aching character. He has noticed a progressive enlargement of the head. For the past several seasons he has had to purchase a hat larger than the one of the preceding season. This season it was necessary for the haberdasher to stretch the largest size hat that he had in stock before a properly fitting one could be obtained. Pain of a dull, aching character has accompanied these head changes.

He stated that he had been near-sighted all of his life and that as far back as he could remember he has had to turn his head in order to look to either side. Since the diagnosis of Paget's disease has been made he has not noticed any pronounced change in his visual acuity.

The numbness and aching of which he complained was not merely confined to the bones which grossly showed evidence of Paget's disease, but there was aching in his left leg, right elbow and in the back. For the past several years he has taken a daily ration of acetyl salicylic acid and phenobarbital in order to obtain relief from these troublesome symptoms. Several months before our examination he noticed a moderate amount of dependent edema in his lower extremities and breathlessness upon exertion.

Family and past history were irrelevant.

Upon inspection one noticed immediately that the patient's head and jaws were much more prominent than normal and that the right leg from the knee down was much larger than its fellow. Upon palpation of the right leg the tibia seemed about twice as large as that of the left leg and the surface was roughened. Elsewhere in the body the bones appeared symmetrical. There was a slight pitting edema of both lower extremities.

The vision in each eye had been reduced to 5/200 and the visual fields had been reduced to 5°. It seemed that only macular vision remained. His fundi were examined by Drs. Courtney and Fay and their report reads: "There is atrophy of the temporal half of each disc in addition to myotic changes."

Examination of the cardiovascular apparatus showed the heart to be regular in rate, the rhythm being disturbed by an extrasystole occurring after every sixth or seventh normal beat. There was a moderate amount of arteriosclerosis in the peripheral vessels and the blood pressure was 130/80. The physical examination was otherwise normal.

The usual laboratory tests, including a blood Wassermann and spinal fluid studies, were made and were entirely negative.

There is no specific treatment for the disease and the best one can do is to treat the case palliatively as has been done in this instance. The cases of fracture of bones involved with Paget's disease are treated in the usual fashion and seem to heal quite as readily as does normal bone. Plastic operations have been done on the jaws in some of these cases with good cosmetic results. Some observers have reported relief of the aching by boring holes in the involved bones and others

have obtained temporary relief with physiotherapy. No observers claim to have a treatment that influences the course of the disease.

DISCUSSION

To say that the optic atrophy in this case is due to Paget's disease is obviously open to question. We know, however, that Paget's disease of the skull does occur in young individuals and is known as leontiasis ossea. For the lack of a better explanation for this atrophy and restriction of the visual fields, I feel that one is justified in assuming that it is due to encroachment upon the nerves at the optic foramina. One wonders if the vision in these cases might not be spared by an operation designed to enlarge the optic foramina and thus decompress the optic nerve. So far as I am aware, no one has reported such an operation.

CONCLUSION

A case of Paget's disease of bone with an associated optic atrophy and a marked restriction of the visual fields is reported. It is believed that these eye complications are due to a stenosis of the optic foramina and that the stenosis is a part of the picture of Paget's disease of bone.

A REVIEW OF CASES OF CONGENITAL DISLOCATION OF THE HIP TREATED AT THE NORTH CAROLINA ORTHOPEDIC HOSPITAL*

By W. M. ROBERTS, M.D.
Gastonia, North Carolina

A review of the disease incidence of all admissions to the North Carolina Orthopedic Hospital shows that the cases of congenitally dislocated hips amount to 1.6 per cent of admissions. The object of this paper is to review our experience in the treatment of a series of forty cases of congenital dislocation of the hips and to advocate the application of preliminary traction to those hips requiring open reduction. I do this latter knowing that many men of longer experience do not feel that this is a useful procedure.

We have used the Hoke traction apparatus on all hips previous to open reduction and it is our belief that by so doing the operative procedure has been facilitated, the time of operation reduced and the danger of trauma to the head of the femur decreased. I hope to be able to demonstrate the efficiency of the Hoke apparatus by appropriate slides.

It will be my object also to review those cases of recurrence and to indicate, if possible, their causes.

It is not my intention to compare the results of open and closed methods of reduction, but in making this analysis such a division of the cases treated was made, patterning after a method used by Dr. F. C. Kidner,[1] of Detroit, and it is hoped that some such standard of reporting end results may be universally adopted.

Dr. Kidner classifies results as excellent, good, fair, poor and bad. Excellent means a perfect clinical result without limp, Trendelenburg sign, disability, loss of motion, shortening, or atrophy and an x-ray in which the changes shown are insignificant. Good means an excellent clinical result without disability, but with a slight limp, Trendelenburg sign, shortening or slight limitation of motion and significant roentgenographic changes. Fair is a little worse than good. Poor represents a considerable handicap. Bad means failure.[1] Into any classification of results the personal equation of the individual reviewer will always enter, but we have leaned to the conservative rather than the optimistic in evaluating these results.

We have not adopted any routine procedure of deciding at what age open or closed reduction should be performed. We are governed rather by the clinical and x-ray findings in each case. At present, up to the age of three years we first attempt a gentle manipulative reduction. If this fails, we do not hesitate to perform an open reduction. The majority of cases of open reduction has been combined with some type of shelving operation to deepen the acetabulum. This latter procedure we now make as simple as possible, doing only enough to make the acetabulum competent and to decrease the slope of the acetabular roof rather than building out immense buttresses of bone as we did in our earlier operations. I make no attempt to review the causes of difficulties of reduction, as these have been adequately covered in many previous articles on this subject.

Reference to the numerical analysis of *Table 1* shows that in our series congenital dislocation of the hip is prevalent in females over males in the

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Thirtieth Annual Meeting, Baltimore, Maryland, November 17-20, 1936.

1. Kidner, F. C.: Comparative Analysis of the Results of Open and Closed Reduction in Congenital Dislocation of the Hip. Jour. Bone & Joint Surg., **17**:25 (Jan.) 1935.

Table 1

ANALYSIS OF RESULTS OF TREATMENT OF CONGENITAL DISLOCATION

Total Cases	Male	Female	Age at Operation (Years)	Present Age (Years)	Right Hip	Left Hip	Both Hips	Open Method	Closed Method	Recurrences: Open	Recurrences: Closed	Results: Excellent	Good	Fair	Poor	Bad	Shelf
40	10	30	1½–18	5–26	9	18	13	34	20	2	6	11	14	18	4	4	30

Four cases had multiple congenital deformities.

Table 2

SUMMARY OF END RESULTS

	Unilateral Dislocation					
	Open Reduction			Closed Reduction		
End Result	Cases	Hips	Per Cent	Cases	Hips	Per Cent
Excellent		1	5.88		5	50
Good		4	23.52		3	30
Fair		11	64.68		2	20
Poor		1	5.88			
Bad		0				

	Bilateral Dislocation					
	Open Reduction			Closed Reduction		
End Result	Cases	Hips	Per Cent	Cases	Hips	Per Cent
Excellent		5	31.25		1	25
Good		8	50.00		1	25
Fair		2	12.50		2	50
Poor		3	18.75			
Bad		2	12.50			

ratio of three to one, that the left hip is involved over the right in the ratio of two to one and that unilateral dislocation prevails over bilateral in the ratio of two to one. There were eight recurrences, two after open reduction and six after closed reduction.

Table 2 would indicate that the greater percentage of excellent results was obtained by the closed method of reduction. However, I believe that the higher age incidence of the open reduction cases undoubtedly affected these end results.

After reviewing the causes of recurrences as shown in *Table 4* I believe that two things stand

Table 3

AGE INCIDENCE

Open Reduction		Closed Reduction	
Cases	25	Cases	15
Bilateral	6	Bilateral	5
Average age at operation	6.6	Average age at operation	2.6
Youngest	2	Youngest	1
Oldest	18	Oldest	4
Present average age	13	Present average age	11.5
Youngest	7	Youngest	7
Oldest	26	Oldest	17

Table 4

Recurrences

Case No.	Age (Years)	Open Reduction
1	6	Open reduction and shelving with subsequent redislocation, bilaterally. Hips later shelved without attempting reduction. Result fair. Mistake probably in attempting reduction into acetabulum.
		Closed Reduction
1	4	Bilateral hips never successfully reduced. Should have been opened. Has good function. Now 18 years old.
2	2	Successful closed reduction 1926. Two years later redislocated and open reduction successful. Shortening of 2 inches due to growth disturbances. Dislocation probably due to shallow acetabulum.
3	2	Bilateral closed reduction December, 1926. Redislocated March, 1927. Only in plaster 3 months. Re-reduced by closed method. Redislocated in anterior plane. Stable but tires easily.
4	3	Successful reduction 1927. Four months in plaster. In 1928 right satisfactory; left redislocated anteriorly; 1929, open reduction; result excellent.
5	4	1932 successful closed reduction; three months in plaster; weight bearing in four months. Redislocation took place. Open reduction and shelving performed. Excellent clinical result.
6	2	1932, successful closed reduction, four months in plaster. Redislocated anteriorly. 1935, open reduction. Head shows considerable circulatory change. Clinical result good.

Table 5

X-RAY APPEARANCE AFTER OPEN REDUCTION

Case No.	Age	Head	Acetabulum
1	7	No change	Competent
2	15	No change	Competent
3*	4	Marked flattening; coxa vara; Legg's	Competent, good depth
4	3	No change	Competent, good depth, some bony deposit
5	4	Atrophy of head; coxa valga; shortening of extremity 2½ inches	Incompetent
6	6	Marked mushrooming of heads (bilateral)	Right competent; left fusion hip
7	12	Head developing normally. Some shortening of neck	Competent
8	3	Mushrooming head and thickening of neck	Competent
9	5	Heads well developed	Competent
10	18	Roughening of head	Competent
11*	4	Marked loss of head; coxa vara	Incompetent
12	5	Moderate flattening; heads smooth	Competent
13	3	Heads well formed	Somewhat shallow and roughened surfaces
14	10	Heads flat; coxa vara	Incompetent
15	6	Marked changs in heads; two open reductions	Incompetent
16	7	Heads developing well	Competent
17	10	Marked flattening with coxa vara	Competent
18	15	Head undergone destruction	Incompetent
19	4	Heads developing well; right coxa vara	Competent
20	10	Marked changes in head	Competent
21	4	Head normal	Incompetent
22	5	Left normal; right marked changes	Left competent; right incompetent
23	5	Head normal	Competent
24*	3	Head normal	Competent
25	12	Marked destruction of head	Competent
26	8	No change in head	Competent
27	8	Considerable flattening	Competent
28	4	Marked thickening of neck; head underdeveloped	Competent

*Multiple congenital deformities.

Table 6

X-RAY APPEARANCE AFTER CLOSED REDUCTION

Case No.	Age	Head	Acetabulum
1	4	Very atrophic	Not developed (unsuccessful reduction)
2	2	Somewhat small; neck thickened	Competent
3	3	Heads flattened; coxa valga	Competent
4	2	Typical Legg's picture	Competent
5	2	Flattened head, right	Incompetent
6	4	Head well developed	Shallow
7	2	Heads well developed	Left normal; right shallow, head anterior
8	1	Head normal	Shallow
9	2	Head developing excellently	Competent
10	3	Head excellent, right; flattening, left	Right shallow; left excellent

out as contributing to failure: first, too short a period of fixation in plaster; and second, failure to choose the proper procedure of reduction for the particular case.

The study of *Tables 5* and *6* was most interesting in revealing that eighteen cases, or 64 per cent, showed some change in the femoral head following open reduction. Seven cases, or 25 per cent, evidenced some incompetency of the acetabulum. Six cases, or 60 per cent, showed changes in the femoral head following closed reduction, and four cases, or 40 per cent, showed a defective acetabulum following closed reduction.

These changes in the femoral head and neck are of varied types, namely, coxa vara and Legg-Perthe's disease, small heads showing retarded development, flattening of the head and mushrooming of the head.

The fact remains, however, that these changes in the heads and acetabula may occur and yet the patient have an excellent clinical hip free from pain and with excellent motion.

The author is indebted to Dr. O. L. Miller, former Chief Surgeon of the North Carolina Orthopedic Hospital, for the privilege of using his cases in making this review.

DISCUSSION (*Abstract*)

Dr. Fred A. Jostes, St. Louis, Mo.—Congenital hips are seen more and more infrequently in the United States. South and south central Europe still lead in the number of cases. It has been my privilege to have some twenty-seven cases come under my supervision in various clinics and in private work, including the Missouri State Crippled Children's Service at Columbia, Missouri, which I was privileged to organize and direct for its first two years of service.

Such a review of a series of cases as presented by Dr. Roberts is not only helpful in aiding us to fix definitely in our minds the methods of choice in treating congenital hips, but it also gives us a bit more courage when we see that even under most favorable circumstances, failures or near failures are obtained.

I attempt closed reduction in children up to the age of five years. However, this method has been found to fail in children as young as 2 years. Rarely more than one trial at closed reduction is made. No great force is ever used to produce reduction. If gentle but properly directed force fails, open reduction is adopted.

I also feel that even in open reduction, great force should not be used in putting the head of the femur into the acetabulum. With the use of a bone skid and mild leverage on the shaft of the femur, the head should slide into place. To be assured of such ease in reduction, I feel that all tissue shortening should be properly provided for before open operation is attempted. This is obtained by use of traction, usually skeletal in nature, until the head is brought down almost opposite the acetabulum, and with the leg in mild adduction to prevent unnecessarily great pressure from damaging the head. It is frequently found necessary to section the fascia lata under local anesthetic. After such a procedure, the head will come down promptly and open reduction may be accomplished without much damage to joint tissues. If at the time of operation the acetabulum is found to be too shallow for the head, even after removal of all soft tissues, I do not resort to reshaping the head or the acetabulum, but do lay down a shelf and keep the head from sliding upward by maintaining the skeletal traction as outlined by Dr. Frank Dickson, of Kansas City. Only in this way can I be assured of holding the shelf in its intended position. When the acetabulum is found to be of the wandering type, I turn down the upper half of the same in cap fashion and put some bone blocks behind the created shelf.

There is still much to be learned about the treatment of congenital hips and only by comparison of methods and results obtained can we come to any conclusion. It is my belief that the delicacy with which open or closed methods are carried out determine the end result.

Dr. Athey R. Lutz, Huntington, West Va.—Two years ago, at the meeting of the American Orthopedic Association, I had the opportunity to hear a symposium on congenital dislocation of the hip which consisted of nine papers by eminent American orthopedic surgeons; four of these papers reported a total of 832 dislocated hips, treated either by closed or open reduction, giving the results obtained in each case. Three hundred and eighteen hips were treated by open reduction, including the shelf operation, with an average of 84 per cent good, satisfactory or excellent results, leaving 16 per cent for bad and poor results. Five hundred and fourteen hips were treated by the closed, manipulative method with an average of 44 per cent satisfactory results and 56 per cent bad or poor results. Here we have well on to a thousand dislocated hips treated by different surgeons with 84 per cent satisfactory results from open operation and 44 per cent satisfactory results from the closed method. I have tried to draw a mean set of conclusions from those found in the above named reports. One may lean slightly toward closed reduction, while another may be slightly more enthusiastic about open reduction, but the following seem to be average conclusions:

(1) Closed reduction is successful in 44 per cent of the cases.

(2) Open reduction is successful in 84 per cent. (This includes the shelf operation for older cases.)

(3) Open reduction is a safe procedure.

(4) Closed reduction is the method of choice for cases of one, two, and perhaps three years of age.

(5) Excessive force should never be used when reduction is attempted by the closed method. If force is required, even in very young children, open operation should be the method of choice.

The ruthless use of closed reduction certainly is to be condemned. In 1920 Galloway advocated open reduction, even in young children, and denounced the closed method as "blind, irrational, and deplorably uncertain in results."

I do not hesitate to say that in my opinion the so-called Lorenz bloodless operation has been directly responsible for producing many almost helpless cripples

since the method of treatment was popularized, with considerable publicity, in this country.

Of course I realize that personal aptitude plays a great part in the results obtained by any method. Perhaps some surgeons feel that it is easier to manipulate a hip than to do an open reduction, and some may manipulate a hip who do not feel themselves capable of a heavy hip operation. That is where they are wrong, for more permanent deformities can result from forceful manipulation than from a careful open reduction. I am afraid that some surgeons do not know their own strength when manipulating a hip where the head of the femur temporarily and often vigorously resists being forced across the rim of the acetabulum. Much crippling and loss of function may be caused by forceful manipulation.

PERNICIOUS MALARIA IN CHILDREN: A REPORT OF 24 CASES*

By JULIAN P. PRICE, M.D.
Florence, South Carolina

Despite the fact that much time, money and effort have been spent in attempting to eradicate malaria in this country, the disease is still present in many localities and plays a large part in child morbidity and mortality in certain Southern states. A detailed study of the severer forms of malaria in infants and children has not been published within recent years. For this reason the following 24 cases are reported.

Pernicious malaria is the form of the disease which is usually rapidly fatal unless prompt adequate treatment is instituted. It may be divided into three types: the algid, the comatose, and the hemoglobinuric. To these I wish to add a fourth which has been alluded to by some writers, but never specifically designated as a form of pernicious malaria. This is a type encountered in young infants which produces a profound anemia associated with irregular fever and marked splenomegaly. Although malarial cachexia is recognized, as well as a moderate degree of anemia which accompanies an attack of malaria, this form of pernicious malaria in infants has not been described as a clinical entity. Three of my patients fall in this group, and these are reported in detail (*Cases 1, 2* and *3*). Pernicious malaria with hemoglobinuria is extremely rare in children and three of my cases presented this phase of the disease. The remaining 18 cases belong to the algid and comatose types.

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*From the Department of Pediatrics, The McLeod Infirmary, Florence, South Carolina.

Case 1.—B. G., a white male infant of one month, was brought to the hospital acutely ill. The baby was born approximately one month premature. At the time of his birth his mother had malaria and he was born precipitately during a chill. Since birth the infant had not gained weight and had suffered with jaundice, anorexia, diarrhea, vomiting, and fever. Growing progressively worse, the baby was finally brought to the hospital with a diagnosis of icterus neonatorum.

Physical examination upon admission showed a small, weak, stuporous, acutely ill infant. The skin and conjunctiva were deeply jaundiced, and the subcutaneous tissues showed evidence of dehydration. The heart action was weak, but otherwise normal. The abdomen was scaphoid, the spleen was enlarged to the level of the umbilicus, and hard. The hemoglobin was 30 per cent; the white cells numbered 24,000 with 75 per cent polymorphonuclears; the red cells were found to be teeming with full grown tertian malarial parasites.

The infant was immediately given 3 grains of quinine intramuscularly and glucose solution intravenously. Shortly thereafter 80 c. c. of whole blood were administered intravenously. More quinine was given twelve hours later, but in spite of these measures the infant grew progressively worse and died 72 hours after admission. A blood smear made just prior to death revealed no malarial parasites, but did show many normoblasts which had not been present on the previous examination.

This was the case of an infant who died at the age of one month with evidence of overwhelming malarial infection: anemia, splenomegaly, jaundice, and malarial parasites in the blood.

Case 2.—D. E., a white male infant, aged 11 months, was admitted to the hospital on account of rapidly developing anemia. The family history was irrelevant. The baby was born at term and appeared to be normal until one month before admission, when he developed a low daily afternoon fever which the parents considered of little consequence. There were no chills. They noted, however, that the baby was becoming progressively paler and at the end of a month were sufficiently alarmed to consult their family physician, who suspected malaria and referred the case to me.

Physical examination upon admission revealed a chronically ill infant with temperature 101°, pallor, an icteric tint, muscular hypotonia, and splenomegaly. The remainder of the examination was essentially negative.

Studies of the blood revealed a hemoglobin of between 10 and 15 per cent, a white cell count of 7,200 with 55 per cent polymorphonuclears and 45 per cent lymphocytes, and large numbers of tertian malarial parasites.

The baby was given three grains of quinine intramuscularly and 180 c. c. of whole blood intravenously. He was discharged from the hospital after twenty-four hours to the care of the family physician, on quinine and large doses of iron. Recovery was rapid and a report from his physician one month later stated that the baby was afebrile, was developing a good color, and was progressing nicely.

A child of eleven months during the period of one month developed a severe anemia associated

with splenomegaly and low grade fever which disappeared rapidly following administration of quinine and a blood transfusion.

Case 3.—J. L., a white male infant, was first brought to my office at the age of 6 months. The parents stated that he had never been strong and that various formulas had been used in an effort to aid in his growth. He made slow progress up to the age of 5 months, but from then on appeared to lose ground. Fretfulness, a low fever and mild diarrhea developed. The family physician, finding an enlarged spleen, advised consultation because of suspected leukemia. Positive findings on physical examination at that time were: fretfulness, pallor, mild rickets, poor nutrition, and a spleen enlarged to within an inch of the umbilicus. Blood studies revealed a hemoglobin of 50 per cent, normal white cell and differential counts, and estivo-autumnal parasites. Six grains of quinine by mouth daily and large doses of iron were prescribed.

Three weeks later the parents informed me that the quinine had been discontinued because it caused vomiting. The general condition was essentially unchanged except that no parasites were found in the blood. The baby was given 5 grains of quinine intramuscularly and a blood transfusion of 120 c. c. The parents were instructed to give quinine by mouth for at least a month.

The baby improved rapidly, so quinine was discontinued in about three weeks. Improvement continued until the child was nine and a half months old, when fever returned and the infant became weak and pale. Quinine was given by mouth, but only part of it was retained and the child (now aged 10 months) was brought to the hospital.

Examination at this time showed a marked pallor with a slight icteric tint to the skin. The spleen had enlarged until it reached the umbilicus and was hard and firm. The hemoglobin was 34 per cent, the white cells numbered 8,000 with the following differential: polymorphonuclears 50 per cent, lymphocytes 40 per cent, mononuclears 2 per cent, eosinophils 2 per cent, basophils 1 per cent. No malarial organisms were found (probably because of the small amount of quinine which the patient had retained in the preceding few days).

In view of the past history the family finally agreed to leave the patient in the hospital for a few days. Five grains of quinine were given intramuscularly and 180 c. c. of blood intravenously. Twelve hours later the same dose of quinine was repeated intramuscularly and oral administration of the drug was started. At the end of four days the child was afebrile and greatly improved. He was discharged, and the family agreed to continue the quinine as directed.

I saw him one month later and there had been great improvement in his condition. He had been afebrile, his spleen had receded an inch and he was gaining weight rapidly. Quinine was continued for another month.

A report three months later stated that the improvement had continued and that the baby appeared to be normal for the first time in his life.

An infant at six months of age showed evidences of severe malarial infection with anemia, splenomegaly, and fever. Only temporary improvement followed the use of quinine, since the family failed to give the drug as directed. Finally, at the age of ten months when the hemoglobin had dropped to 34 per cent, the baby was hospitalized. After this the parents cooperated fully in the administration of quinine and the infant was cured.

DISCUSSION

Age Incidence.—Pernicious malaria may occur at any age; three of my cases were in infants under one year. In this series pernicious malaria in small infants tended to produce a rapidly progressive anemia. Hemoglobinuria, on the other hand, which was observed in three cases, occurred only in later childhood at 8, 10 and 11 years, respectively.*

Past History.—Almost every child in this series came from a malarial district, but only ten gave a history of having had malaria in the past. It seems, therefore, that an attack of pernicious malaria may be the first evidence of the infection in a child.

Eight of these children had received some type of anti-malarial treatment before being admitted to the hospital, six having received quinine in some form, one "atebrine" and one sodium cacodylate. In no instance, however, had a sufficient amount of the drug been given to produce results.

Pre-admission Diagnosis.—Diagnoses made by the attending physicians before the children were admitted to the hospital were:

Malaria	10
Gastro-intestinal disturbance	3
"Acute abdomen"	3
Meningitis(?)	1
Encephalitis(?)	1
Icterus neonatorum	1
Leukemia(?)	1
No diagnosis	4
Total	24

Most of the diagnoses were made from clinical findings by physicians who are accustomed to treat a great deal of malaria, and they afford eloquent testimony as to the difference between the symptomatology of pernicious malaria and malaria of the usual type. This also shows the necessity for careful blood examinations in dealing with diseases of undetermined cause.

Rapidity of Onset.—Malaria in children is usually thought of as a disease in which the patients are fretful and uncomfortable during the febrile stage, but in which symptoms that sug-

*Since that paper was written I have had a fourth case of hemoglobinuria in a girl, aged 4. She recovered under treatment.

gest a fatal outcome are slow in making their appearance. A study of these cases shows that this does not hold true in pernicious malaria. Convulsions, stupor, severe vomiting, and abdominal pain appeared early, in some cases within the first twelve to twenty-four hours. Delirium was noted within 48 hours in three cases, and within 72 hours in two more. A 12-year-old boy was brought to the hospital 24 hours after the initial symptoms of headache and drowsiness. By this time he was in a deep coma, and in spite of treatment died 12 hours later. That a healthy boy of 12 may develop malaria and die within 36 hours seems incredible, but it does occur.

Fever and Chills.—Fever of some degree was noted in every case. On admission the temperature varied from 97.6° to 108°. In the hospital the temperature curve was so altered by quinine as to be of little significance. In four of the seven fatal cases there was a terminal hyperpyrexia ranging from 107° to 108°. In those who recovered, fever disappeared within a period of one to seven days.

Although a chill is usually considered the *sine qua non* of malaria, in only four children of this series (16 2/3 per cent) was this symptom noted; in three of these, the chill preceded the onset of hemoglobinuria.

Vomiting.—Vomiting was present in 15 cases and was very severe in six. No therapy other than anti-malarial was of value in treatment of this symptom.

Diarrhea.—Although it is commonly believed that diarrhea is frequently encountered in pernicious malaria, only one child in this series suffered from this.

Headache, General Malaise.—There appeared to be general malaise at the onset in every case. Five of the children complained of headache and one of backache.

Abdominal Pain.—Abdominal pain occurred in seven children and in three instances was so severe that a diagnosis of "acute abdomen" was made by the attending physician. This pain was usually generalized, although in one case the pain and accompanying tenderness were centered over the right lower quadrant. Vomiting invariably accompanied abdominal pain.

Drowsiness, Stupor, Coma.—Some drowsiness was present in every case. It was interesting to observe that the drowsiness was present regardless of the degree of fever and appeared to be due to malaria and not to high temperature. Eighteen of the twenty-four children developed stupor which, in five instances, progressed into coma.

Convulsions.—Convulsions occurred in four of the cases. In each instance the first convulsion appeared within eighteen hours of the onset and in two cases within the first six hours. Judging from the results, the convulsions served a useful purpose, since invariably the child was brought to the hospital and treatment was instituted within 24 hours of the onset. All four children recovered.

Findings on Physical Examination.—Fourteen of these children showed a yellowish sallow color to the skin which had not been present before the illness. In one infant the color change was so marked that a diagnosis of icterus neonatorum was made by the attending physician. The "cold and clammy skin" frequently referred to in discussions of algid malaria was present in only five cases. In no instance were there hemorrhages into the skin.

An enlarged spleen was found in 15 cases. In nine of these there was a history of a previous attack of malaria and three others belonged to the group of infants with rapidly progressing anemia (all had been sick for a month). In other words, out of 12 children over the age of 1 year, having their first attack of malaria, only three had splenomegaly. From this series, it would appear that pernicious malaria itself produces an enlargement of the spleen in only 33 per cent of the cases.

Generalized abdominal spasticity was found in four patients.

Abnormal neurological findings were present in several instances. The incidence of stupor, coma, convulsions and delirium has been mentioned. Seven children showed sluggish response to reflex stimulation. One child had a positive Kernig's sign and another slight stiffness of the neck.

Many of the children gave evidence of faulty nutrition. One child had suffered from a congenital heart disease since birth and presented the typical picture of this condition upon admission.

Blood Changes.—A moderate degree of secondary anemia was present in a majority of the patients; in five the anemia was severe with a hemoglobin less than 50 per cent; and in two children the hemoglobin was 15 per cent. As has been stated, many of these children were poorly nourished. They came from poor families and it was evident that the anemia must have been present before the onset of pernicious

malaria. It was impossible, therefore, to ascertain the degree of anemia produced by the disease itself, except in those cases associated with hemoglobinuria and those in which the infantile type of progressive anemia was present. In these two types there was rapid appearance of anemia.

The white cell count in these cases was as follows:

4,000	to	7,000	12 cases
7,000	to	10,000	6 cases
10,000	to	20,000	3 cases
20,000	to	25,000	3 cases

In other words, one-half of the patients had a leukopenia, one-fourth a normal count, and the remaining fourth a leukocytosis. It has become the rule in our laboratory to suspect malaria in the presence of a leukopenia, but not to dismiss the possibility of malaria because of a leukocytosis. The white blood count appears to be of little prognostic value, although it is interesting to note the mortality rate in the three groups.

12 patients with leukopenia (4,000-7,000), mortality 42 per cent.
6 patients with normal count (7,000-10,000), mortality 0.
6 patients with leukocytosis (over 10,000), mortality 33 per cent.

There were no suggestive changes in the differential count.

Malarial Parasites in the Blood.—Malarial parasites were found in the blood of 22 patients (92 per cent). In the two remaining cases the history of past malaria, type of onset, physical findings, hemoglobinuria, and dramatic response to treatment made it evident that no other diagnosis than that of malaria was tenable. Of the twenty-two smears positive for malaria, nineteen showed the estivo-autumnal and three the tertian type of parasite.

The numbers of parasites found varied. In one instance, a single parasite was finally found after exhaustive search on five different occasions; at the other extreme was a 6-year-old boy in whom 26 per cent of the red cells contained organisms; both of these patients recovered. One boy was found to have 10 per cent of his red cells inhabited by malarial parasites. Sufficient treatment was given to rid the peripheral circulation of parasites, and yet the boy died. From study of these and the other cases in this series, I have come to the conclusion that there is no definite relationship betwen the number of malarial parasites in the peripheral circulation and the eventual outcome.

Hemoglobinuria.—Hemoglobinuria was present in three cases. In each instance the appearance of hemoglobinuria was preceded by a chill and by vomiting. The urine was reddish black in color and gave a strongly positive test for hemoglobin. Microscopic examination showed an absence of red blood cells. All of these children gave a history of having had malaria previously, and all three recovered under treatment with quinine.

Treatment of Pernicious Malaria in General.—The only drug used in the treatment of these children was quinine. I have not had any experience with "atebrine" in pernicious malaria. Untoward results following the use of "atebrine" in adults in this vicinity have made me wary of employing it. This fact, together with the good results obtained from quinine, have led me to the conclusion that quinine is still the drug of choice in the treatment of pernicious malaria in children.

The easiest method of giving quinine is by mouth. In pernicious malaria, however, time plays such an important part and vomiting is so frequently present that some other method of administration must be employed. In only two cases in this series was the oral route used at the beginning of treatment with success. In the other twenty-two the drug was introduced intramuscularly or by vein. When giving quinine by mouth, it is my custom to dissolve the desired amount of quinine sulphate in a small amount of an alcoholic flavoring extract. This is comparatively palatable, is readily absorbed, and is more effective than the chocolate preparations on the market.

Theoretically it would seem that introduction of quinine directly into the blood stream would be the ideal method. There is a feeling, however, that the drug acts not directly but through the formation of a decomposition product, and furthermore, the procedure is not without danger since sudden death during intravenous administration has been reported. In only three of my cases was the intravenous route employed. Two of these patients recovered and one died. There was no reaction following the injection itself, but I believe that the same good results would have followed intramuscular injection of the drug, and there would have been far less anxiety on the part of the attending physician. When giving quinine intravenously I dilute it in 300 to 400 c. c. of normal salt solution and allow it to enter the blood stream very slowly.

The method of choice, therefore, which is both safe and effective is to inject the drug intra-

muscularly in the form of quinine dihydrochloride. In the first case treated I injected a concentrated (50 per cent) solution of quinine dihydrochloride into the muscle. The boy recovered, but the areas injected sloughed and he still carries the scars of my treatment. Since then I have always diluted the drug in normal salt solution to make a 5 per cent solution. In only one instance has an untoward local result occurred; in this case the house physician gave a second injection in the same area. Either because of this or because of a break in sterile technic, the boy developed a large abscess in the gluteal muscle. Fortunately he recovered and the abscess healed rapidly following drainage.

The initial dose of the drug depended upon the age of the patient, but it is well known that children tolerate and require large amounts of quinine. Infants under one year were given from three to five grains, older children from five to fifteen, intramuscularly. This dose was repeated every twelve to eighteen hours until quinine could be tolerated by mouth. Frequently one injection was all that was necessary; in other cases two or three were required; in no instance were more than three injections given, since the children either had recovered sufficiently to tolerate the drug by mouth or had expired.

When the acute symptoms had subsided and the drug could be taken orally, two to five grains of quinine sulphate were given three to four times daily for a week after the temperature was normal. Then the parents were advised to give a single dose each night for four weeks. As most of these patients came from rural districts where a physician is not called except in severe illness, it was impossible to find out whether the malaria was completely eradicated or had recurred. I feel certain, however, that they would have returned to the hospital had the recurrence been severe. Only one patient did return with an acute exacerbation, but the parents acknowledged that the quinine had been discontinued before the prescribed amount had been given.

Treatment of Pernicious Malaria with Hemoglobinuria.—The advisability of giving quinine to malarial patients with hemoglobinuria is one that has evoked a great deal of discussion. If the hemoglobinuria is due to malaria, which it undoubtedly must be, then quinine appears to be indicated. On the other hand, the use of the drug has been reported to cause either further paroxysms or anuria. The method which I use might be termed a compromise. As soon as the diagnosis is established, a small dose (5 grains) of quinine is given intramuscularly. A specimen of urine is examined after each voiding, and the total output recorded. In the meantime, fluids are given parenterally and if possible a blood transfusion. If at the end of twenty-four hours no deleterious effects of the quinine have been noted (urinary suppression or increased hemoglobinuria), another 5 grains are given intramuscularly. This is repeated daily until the urine is normal or until quinine can be taken by mouth. This method of treatment was employed in all three of my cases and all recovered. It was originated by my colleague, Dr. Walter R. Mead (internist), and has proven highly successful in the treatment of adults with the same condition.

Mortality and Prognosis.—Out of twenty-four cases, seven, or 29 per cent, died. Of these, four expired within eighteen hours of admission. A girl of 5 years died with a terminal temperature of 107.4° in spite of vigorous treatment over a period of 48 hours. Enough quinine was given another child to free the peripheral circulation of parasites, but in spite of this he went into delirium and coma and died within three days. This patient had been acutely ill for five days and there was no palpable radial pulse upon admission. The last death was that of a month-old premature baby (*Case 1*) with severe anemia.

From this analysis we may conclude that the first twenty-four hours of treatment will tell the story, as only three children died who passed the twenty-four hour mark, and one of these was pulseless when treatment was started. Another was a premature baby of one month with a severe anemia.

There is no apparent relationship between the duration of the disease before treatment is started and the eventual outcome. A well-nourished 12-year-old boy was given 15 grains of quinine 24 hours after his first complaint of headache and drowsiness, and died twelve hours later. Another boy, aged 5, had been feverish, nauseated and stuporous for forty-eight hours and semi-delirious for twenty-four hours before treatment was begun. He recovered. Neither does there seem to be any relationship between a history of a previous malaria and recovery, nor between the number of red blood cells infested by parasites and recovery.

The prognosis in pernicious malaria depends upon the virulence of the parasite and the ability

of the patient to live twenty-four hours after treatment is instituted.

CONCLUSION

An analysis of twenty-four cases of pernicious malaria has been presented. Three of these cases are reported in detail, three infants under 1 year of age with severe progressive anemia associated with splenomegaly.

RELATION OF THYROTOXICOSIS TO EMOTIONS*

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INTRODUCTION

The mechanism of emotional responses in human beings is not clearly understood. The immediate provoking causes of anger and fear, to mention the major emotions, may be apparent, but the complex physiological response that follows the exhibition of the provoking cause calling into play as it does the specific mechanism localized in the central nervous system, is not so clearly understood. The extensive interactions of the integrating factors in the emotions is far too complicated to be understood at the present time without greater knowledge of the functions of the cerebral centers related to what might be termed the "emotional process."

One cannot speak of an emotion as a simple process, because all emotions and emotional states vary in intensity and complexity during their existence and from one occasion to another. Affective states, which term may be properly used to embrace milder emotional manifestations, may vary with variation of the stimulus, the eliciting of the more marked emotional response may depend upon the degree of the affective state. As we study emotions and emotional affective states, it is difficult to do more than to define or explain in detail the manifestations of these states. Certainly, it is obvious from experience that no two individuals react identically to the same emotional situation, nor does the same individual react in an identical fashion to the same stimulus occurring at different times.

Each responding personality is highly individualized, subject to peculiarities of temperament, disposition, constitutional response and emotional reaction. It is this individuality which renders the study of the emotions difficult. To understand fully the emotions and their elaborate expressions they should all be studied carefully and completely in every individual, but this is obviously impossible. Hence, in studying this subject, it is necessary to group together as far as possible all individuals of the same type, establishing the groups upon factors of race, endocrine organization as related to race, constitutional inheritance, and environmental manifestations as derived from similar early education, religious training and social status. With this grouping of "similar" individuals, it is sometimes possible to establish a similarity of emotional response within the group which, up to a certain point, can be explained by the same factors.

THE PATHOLOGY OF HYPERTHYROIDISM

(A) *Anatomic.*—The pathologic changes occurring in the thyroid gland have been subject to such a variety of interpretations that until recently no uniform classification existed. Owing to the extreme difference of opinion between clinicians and pathologists in the classification of goiter, the American Association for the Study of Goiter appointed a committee to attempt to bring out of the chaos some system that would serve as a basis for correlation of the pathologic and clinical states. The tentative clinical classification included four types of goiter: (1) non-toxic diffuse goiter; (2) toxic diffuse goiter; (3) non-toxic nodular goiter; (4) toxic nodular goiter.[1] This classification gave a good basis for clinical grouping, and at the same time replaced the old terms of endemic goiter, colloid goiter, exophthalmic goiter and adenoma of the thyroid, which were inadequate attempts to express both clinical state and pathology in the same term.

Difficulty attended the establishing of a diagnosis of a normal thyroid. W. F. Rienhoff, Jr., in his outstanding work,[2] has contributed most valuably to our knowledge of both the normal and the pathologic gland. The normal gland, in addition to the usual histology, presents a number of undeveloped follicles, small and non-functional, which serve as a tissue reserve. When unusual demand is put upon the gland, these follicles undergo hyperplasia and hypertrophy and assume a function of secretion of thyroxin. In the thyroid of the exophthalmic syndrome, these

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follicles are diminished because of the fact that they have all, or in large part, undergone the development to maturity.

Rienhoff[3] states that he has never seen or encountered a case of clinical hyperthyroidism in which hypertrophy and hyperplasia of the thyroid parenchyma could not be demonstrated, if sections were cut from different regions of the gland. It may be difficult to differentiate the hypertrophy and hyperplasia of the hyper-active thyroid gland from that which occurs as a compensatory condition, such as is seen in the glands of dogs following removal of the thyroid.[4]

With the introduction of the use of iodine to control the active phase of the pathologic process in hyperthyroidism,[5] it was possible for Rienhoff and Lewis to study objectively the changes taking place in the thyroid gland following administration of iodine. During the pathologic study which was carried out by sectioning the thyroid gland during the active stage of the disease before the administration of iodine and comparing these sections with those of the same gland removed at operation after administration of iodine, they were able to correlate the clinical manifestations with the pathologic state of the gland in both the pre and post iodine intervals.

THE ETIOLOGY OF HYPERTHYROIDISM

A consideration of the etiology and pathogenesis of hyperthyroidism leads one into fields that embrace the two great integrating systems of the human body, the nervous system, both central and peripheral, including the autonomic nervous system, and the endocrine system, which include those major glands which are concerned with the development and function of the human body.

As knowledge of the dysfunctions of the thyroid gland increased, it became more evident that we were not dealing with a simple physiologic uniglandular dysfunction in disturbances of this gland. The widespread interrelationship between alterations in function of the thyroid gland and the special tissues of the body placed the gland in a new relation to the human economy. This gland which was known as the "regulator of metabolism" and considered as the only gland concerned with metabolism, soon took its proper place as one of the glands in a metabolic harmony which is mediated through and maintained by a complex neuro-endocrine mechanism whose integrated function depends upon the delicate physiochemical-psychologic balance of the individual.

While the thyroid gland is only one of the many glands that assist in the maintenance of constitutional functional balance, it is nevertheless a very important factor in this process. It is so delicately balanced in its function, and so closely related to the other factors of the integrating system, that any disturbance in the system may serve to unbalance this gland to the extent that its function becomes heightened and a state of thyrotoxicosis results.

Among the predisposing factors in the production of Graves' Disease are the pre-existing diseases of the thyroid gland. Rienhoff has shown that the clinical symptomatology of hyperthyroidism is always associated with modifications in the thyroid gland.[6] Conversely, however, hypertrophy and hyperplasia, the structural alterations of the gland associated with true toxic diffuse goiters, are not always accompanied by symptoms of thyrotoxicosis. It is this discrepancy that raises the question as to whether hyperthyroidism is primarily a disease of the thyroid gland.

The second predisposing factor, and one probably of equal importance with the preceding, is the constitutional factor which may be said to embrace both personality background and the heredity of persons affected with hyperthyroidism. Katzenelbogen believes that the constitutional factor, considered in the broad sense of both hereditary and acquired factors, is unquestionably important and that a careful history of both patient and relatives will always disclose a background of emotional instability, Graves' Disease, or the so-called "nervous temperament," which responds at some time to an exciting cause, usually a psychic trauma, with the development of hyperthyroidism.[7]

The third predisposing factor is an imbalance of the autonomic nervous system. Among those advocating this view, maintaining that the autonomic nervous system is the underlying factor in the production of thyrotoxicosis, and also that the symptoms of thyrotoxicosis are due to imbalance of the autonomic nervous system, chiefly the sympathetic portion, are Barker,[8] Friedgood,[9] Hyman and Kessel,[10] and Danielopolu.[11]

The existing causes of importance, which may also serve as predisposing causes, are emotional shock or psychic trauma, infections, nervous exhaustion, iodine deficiency, the glands of internal secretion, chiefly the anterior lobe of the pitui-

tary through its thyrogenic hormone, the medulla of the adrenal, and the thymus.

The relationship of the emotions to the etiology of thyrotoxicosis has been a well accepted fact for many years.[12] Psychic trauma has been known as an exciting factor in thyrotoxicosis.[13]

The mechanism concerned in the production of thyrotoxicosis following emotional shock has been well elaborated by W. B. Cannon.[14] He has shown that in fright the medulla of the adrenal secrets an excess amount of adrenalin, which appears in the blood stream. At the same time, the secretory activity of the thyroid is increased and the sympathetic nervous system rendered hyperactive. The clinical picture of fright results in one closely simulating sympathetic stimulation; with tachycardia, exophthalmos, widened palpebral fissures, dilated pupils, paralysis of the intestinal tract. If this condition persists, the clinical picture of thyrotoxicosis appears. It is impossible to say what determines the persistence of the terror picture in some cases, and its disappearance in others. Cannon suggests that the fixation can be interpreted as due to the persistence of the stimuli which originally evoked the reaction, persistence being due to the fact that they are not naturally eliminated by completion of the emotional impulse, the completion being impossible because of recurrence of the original stimuli (memory) with emotional attachments (terror, remorse), or because of association with a common object which being repeatedly encountered forms a part of a conditioned reflex.

The vicious circle thus established can theoretically be broken at any one of several points, namely, by reducing thyroid activity, by destroying sympathetic innervation, by reducing the activity of the medulla of the suprarenal or the concentration of adrenalin in the blood stream. Breakage at either the first or second points mentioned is usual and effective.

ANALYSIS OF FIFTY CASES OF HYPERTHYROIDISM

The series presented consists of fifty cases of hyperthyroidism collected in the author's routine practice of internal medicine over a period of five years. The cases represent all degrees of severity of both toxic diffuse goiter, or exophthalmic goiter, and toxic nodular goiter.

In the series there are forty-three females and seven males. The age range is from 18 to 60 years. There were forty-two cases of toxic diffuse goiter and eight cases of toxic nodular goiter. The occurrence of cases in age groups together with other factors related to the age groups is included in the following tables:

Table 1

Years	Number of Cases	Sex	Range of B.M.R.	Average B.M.R.
18-25	9	M.1-F.8	Plus 10-43 per cent	Plus 19 per cent
26-40	25	M.3-F.22	Plus 10-28 per cent	Plus 14 per cent
41-60	9	M.2-F.7	Plus 10-20 per cent	Plus 13.5 per cent
61-	7	M.1-F.6	Plus 12-43 per cent	Plus 20.6 per cent

In *Table 2* are listed the symptoms that presented themselves in this series of hyperthyroid cases.

Table 2

(1) Nervousness, subjective and objective	(15) Insomnia
(2) Emotionalism	(16) Drowsiness
(3) Mental manifestations	(17) Syncopal attacks
(4) Palpitation	(18) Vertigo
(5) Tachycardia	(19) Numbness, arms and legs
(6) Dyspnea	(20) Vague pains about the body, localized or general
(7) Gastric disturbances	(21) Headaches
(8) Loss of weight	(22) "Lump in throat"
(9) Gain in weight	(23) Throbbing sensation in head, neck, shoulders, or general about the body
(10) Loss of appetite	
(11) Excessive appetite	
(12) Fatigue	(24) Tinnitus aurium
(13) Lack of energy	(25) Hyperidrosis
(14) Weakness	

The above symptoms are listed without regard to their specific relationship to the hyperthyroidism. They are presented to show the extreme variation in the symptomatology that may occur in hyperthyroid states.

In *Table 3* are listed the symptoms related to the hyperthyroidism.

Table 3

Symptoms	Frequency
Nervousness, both subjective and objective	45 cases
Fatigability	28 cases
Palpitation	25 cases
Loss of weight	20 cases
Gastric disturbances	19 cases
Dyspnea	17 cases
Emotionalism	16 cases
Tachycardia	9 cases
Loss of appetite	9 cases
Mental manifestations	7 cases

In an analysis of the representative symptoms, we find a variation in the type of symptom presenting itself. The so-called nervous symptoms, which may be either subjective or objective, vary from mild subjective apprehension to extreme irritability or physical tremor.

Fatigability was an outstanding symptom in the cases in which it appeared, showing itself

usually as an inability to carry on arduous and prolonged effort.

Palpitation, occurring in twenty-five cases, varied in severity from a mild to a moderately severe state; the duration was likewise variable. It was usually accompanied by tachycardia, often induced by excitement, strain, or emotionalism. The psychic unrest of the patient was accentuated by the persistence of palpitation, the subjective reaction to the visceral changes was heightened with the production of apprehension, fears and psychoneurotic states.

Dyspnea was not associated with true thyroid heart disease in any of the cases. There was no evidence of cardiac arrhythmia or congestive failure.

Emotionalism, or the condition of exaggerated emotional states, was present in sixteen cases. This took the form chiefly of apprehension, vague and indefinite fears, or fears basically founded. Claustrophobia and agoraphobia were common accompaniments. Mental depression was a frequent symptom, expressing itself in unexplained transient fits of crying. Hysterical manifestations with instability, or states of undue excitement were not uncommon.

DISCUSSION

A consideration of the etiology of hyperthyroidism reveals important facts in the production of this disease which may bear a relation to its emotional expression. The emotional phases are constant accompaniments of the disturbed function and may in their intensity express the degree of underlying thyrotoxicosis. These manifestations are numerous and diverse, varying from simple mild affective states to extreme expressions of uncontrolled anger or fear. Apprehensiveness may be the early expression of the emotion later transmuted to fright; irritability may be the transient forerunner of severe outbursts of anger; while mild antipathy may develop into definite asocial tendencies.

Probably the most common of all the simple associated emotions is fear, often vague and indefinite. It may express itself in personality changes in the individual and subsequently, as a consequence of these changes, alter the relation of the individual to his environment to such an extent that he may be incapable of adjusting to his usual affairs or may be unable to assume and discharge the responsibilities of his normal state of life. Indefiniteness in thought, uncertainty in judgment, indecision in action and ultimate psychic disintegration may follow a persistence or an increase in the intensity of this emotion.

The emotional states of rage and fear manifest themselves in an increased activity of the sympathetic nervous system. Impulses are sent out from the centers of emotion in the thalamus over the autonomic nervous system to all the organs supplied by this system. The symptomatology is similar to that occurring with stimulation of the nerves to the adrenal glands. In these emotional states, the adrenal glands have indeed been shown to be definitely stimulated with resultant increased hyperadrenalemia. The visceral changes that follow the emotional stimulation of the sympathetic nervous system are recognized by the individual and contribute to the intensification of the initiating emotion. The rapid, forcefully beating heart, the coldness of the skin, the sweating, the increased, sometimes labored, respiration, the muscle tremors, the gastro-intestinal disturbances are the essential physiologic components of the emotional reaction.

In the further study of the production of emotions and their relation to the adrenal glands, Maranon has studied the effect of the injection of extracts of the medulla of the adrenal gland.[15] He noted that following the injections the peripheral phenomena, that is, the visceral changes, occurred simulating those occurring during the emotions. In some individuals milder manifestations of emotional disturbances were present, such as excitement, fear, and apprehensiveness; in general the reaction usually lacked psychic content.

Crile has studied in some detail the thyroid-adrenal-sympathetic system.[16] He refers to the brain-thyroid-adrenal-sympathetic system as the "Kinetic" system, and the state of excessive activity he speaks of as "Hyperkineticism." The diseases which are caused by the excessive activity of this system are neuro-circulatory asthenia, hyperthyroidism, peptic ulcer and diabetes. He compares the adrenal and thyroid glands on the basis of their relative power to detonate an oxidative process. The former is an extremely violent detonator, or in other words a powerful excitant, while the latter is less violent and thus produces a sustained energy. The combination of both glands, together with the sympathetic nervous system, forms a unified system which serves to initiate and maintain oxidation under

the conditions of emergency demands or emotional excitation.

The relationship of the anterior lobe of the pituitary gland to the thyroid gland through the thyrogenic hormone has been well established. It has been shown[17] that injection of anterior lobe pituitary extract produces certain effects in the thyroid gland and in the iodine metabolism. This discovery led to the isolation of the so-called thyrogenic hormone which stimulates the thyroid gland in development and function, and which, when present in excess, produces a hyperactivity of the thyroid gland. This effect seems to be direct and not mediated through the sympathetic nervous system.

Karnosh and Williams[18] believe that lesions in the vegetative centers of the hypothalamic region can cause changes in metabolism and thus give rise to sympathetic-endocrine disturbances. They assume that psychic trauma can produce impulses in these centers of primitive emotions which express themselves in terms of fright, grief, anger, and disappointment, all of which may be related to the exophthalmic syndrome.

Kaiser[19] states that the symptoms manifested by individuals under the emotion of fear simulate very closely the physical signs of exophthalmic goiter, differing in the absence of exophthalmos.

THE AUTONOMIC NERVOUS SYSTEM AND THYROTOXICOSIS

The syndrome referable to disturbances of the autonomic nervous system is so similar to that of hyperthyroidism and the emotional responses dependent upon these disturbances bear such a close resemblance to the related responses of hyperthyroidism that it is often extremely difficult to clearly establish the clinical identities of these two conditions. This is especially true in the mild forms and phases of hyperthyroidism. Katzenelbogen suggests:

> "In certain types of hyperthyroidism, the thyroid is not the *primum movens*, but is only one link in the involved chain which includes the ductless glands and the autonomic nervous system, and most important of all the personality background of the patient with its psychobiological reaction."[20]

He further places the autonomic nervous system in an intermediary position between the psychobiological reaction and responses of visceral and endocrine organs. This is seen in the close relationship between the various endocrine glands. Disturbances in one gland often produce disturbances in other glands.

Since the syndrome of these two above conditions are so closely related, it follows that stimulation of the autonomic nervous system may produce signs simulating those of thyroid stimulation and vice versa. In a differential diagnosis between the two conditions, the tachycardia and high basal metabolic rate of hyperthyroidism should be particularly considered. In addition, the personality and psychobiologic reaction preceding the onset of the clinical condition should be investigated carefully, to establish the existence of true hyperthyroidism.

PSYCHONEUROSIS AND THYROTOXICOSIS

Many attempts have been made to establish the relation of thyrotoxicosis to the psychoneuroses, neuro-circulatory asthenia, and other similar conditions. Karnosh and Williams[21] conclude that the type of neurosis developed in conjunction with hyperthyroidism depends upon the emotional constitution associated antecedent to the disturbance.

Conrad states that the effort syndrome, neurocirculatory asthenia and pseudo-Basedow syndrome have similar emotional pictures with instability of the glandular function, which permits emotions to upset the endocrine balance as well as the autonomic nervous system.[22]

Lorand and Moschocowitz,[23] Bram,[24] and Lewis[25] stress the fragility in psychic levels as predisposing factors in the psychoneurotic individuals, and emphasize the psychic traumata which may precipitate the chain of events ultimately culminating in thyrotoxicosis.

In a study of a differentiation between hyperthyroidism and neurasthenia, W. J. Arrasmith gives as outstanding facts the definiteness of symptoms in hyperthyroidism, the stability of the mental attitude of the hyperthyroid towards the symptoms.[26]

The fact is well known that the response to Graves' Disease or thyrotoxicosis varies in each individual case so that no two patients can be said to present identical syndromes. The manifestations will vary, as we have seen with the hereditary balance of the endocrine and autonomic nervous systems, and with the state of balance of these two systems at any given time.

While it is evident that there is a close relationship between the adrenal gland, the autonomic nervous system and the thyroid gland, it does not necessarily follow that the thyroid gland occupies a secondary position in the production of the emotional responses which occur characteristically in this disease. The injection of adrenalin chloride, while it produces obvious visceral symptoms, as described, does not in itself produce true emotional states. If, however, there is an accompanying hyperthyroidism, both the physiologic and the emotional responses following the injection are markedly heightened, so that the individual presents many of the emotional manifestations found in thyrotoxic states.

Santenoise has presented experimental evidence to show that the cerebral functions are affected by variations in the amounts of thyroid hormone in the circulation.[27] Verebely[28] states that sudden demand increases the oxidation in the brain tissues due to increased thyroid secretion. These reports may well indicate that the emotional centers in the hypothalamus participate in the increased cerebral function due to the stimulation by the thyroid hormone responding with the production of definite or indefinite emotional manifestations.

If such is the case, then it may be reasonable to assume that the emotions associated with thyrotoxicosis are related in some way to the amount of thyroxin in the blood stream. It is difficult, however, to establish this fact clinically because in all cases of thyrotoxicosis we have the associated symptomatology referable to the disturbance of the adrenal-sympathetic system, which accentuate any existing emotional tone. It cannot be assumed that the thyrotoxic state can exist and produce effects independently of the rest of the associated system. If such were the case, we might be able to isolate a specific emotional syndrome that was neither adrenal, nor sympathetic in its cause, but thyroid alone.

That hyperthyroidism produces emotional manifestations that are primarily related to the thyrotoxicosis might be well argued from the comparative clinical pictures of this state and that of neurasthenia and autonomic nervous system imbalance. The positive personality of the hyperthyroid individual, as compared with the indifferent and negative personality of the neurasthenic, may serve to assist in the differentiation of the two states. Hyperthyroidism may be, and often is, engrafted upon a personality which is totally or partially unstable, but, nevertheless, it occurs in personalities which are definitely positive, showing no trace of the neurotic strain. In the study of these borderline cases we may find the answer to the emotional manifestations of thyrotoxicosis.

SUMMARY AND CONCLUSIONS

(1) The emotional response of the patient with Graves' Disease varies as a rule with the severity of the condition, and also with the individual constitution of the patient.

(2) A study of the etiology of thyrotoxicosis reveals the association of numerous factors as both predisposing and exciting causes of this condition.

(3) The glands of internal secretion chiefly related to thyrotoxicosis are the medulla of the adrenal, the anterior lobe of the pituitary through its thyrogenic hormone and the thymus.

(4) The central nervous system plays an important part in the etiology of thyrotoxicosis through the centers of emotion.

(5) Injection of extracts of the medulla of the adrenal gland produces pronounced visceral changes without emotional responses in a normal individual. In the thyrotoxic individual, the emotional responses may be severe, resembling the emotionalism of the spontaneous thyrotoxic state.

(6) The symptoms of thyrotoxicosis can be simulated by adrenal stimulation, autonomic nervous system imbalance, or prolonged emotional states.

(7) An analysis of fifty cases of hyperthyroidism reveals numerous symptoms, chief among which are the emotional symptoms, apprehension, fears, depression, worry, irritability.

(8) The intricate relationship of the adrenal-autonomic and the thyroid mechanism makes the problem of isolation and identification of specific symptomatology difficult. It is questionable as to whether the symptoms can be isolated and linked with disturbances of a specific part of this mechanism.

(9) The emotional response accompanying hyperthyroidism may be identical with that produced by stimulation of the adrenal-autonomic mechanism. However, it is possible that the in-

creased thyroxin in the blood stream in the former condition may serve to sensitize the neural mechanism in the central nervous system as has been suggested by Santenoise, and thus result in an emotional response more or less specific for hyperthyroidism.

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PULMONARY EMBOLISM, WITH SPECIAL REFERENCE TO THE ACUTE COR PULMONALE*

REPORT OF A CASE

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An increasing literature testifies to a growing appreciation of the importance of embolic phenomena ocurring in the pulmonary circulation. It is quite probable, therefore, that this complication is being recognized more frequently than in the past. That it is still often overlooked or incorrectly diagnosed cannot be questioned. For example, one has only to recall the discrepancy frequently found to exist between the clinical and pathological diagnoses.

Laennec[5] recognized pulmonary infarction over one hundred years ago and Virchow laid the foundation on which our present conception is based. Thrombo-embolic disease has been the subject of a great deal of study, but much of the credit for the present conception must go to our surgical confreres, whose contributions have gone far to clarify our understanding of the subject. However, we are still in the dark regarding some of its very important phases, such as the real cause of thrombus formation and its prevention.

Statistics indicating the frequency with which this complication occurs appear to vary rather widely, no doubt dependent upon the keenness of the observer and the prominence of the picture on the one hand and the care exercised by the pathologist on the other. For instance, Belt[1] demonstrated their presence in 10 per cent of autopsies. Hosoi[2] reviewed the literature and found that the incidence varied from 0.1 to 0.67 per cent. Nystrom[3] reports a mortality from pulmonary embolism of 0.27 per cent in 3,800 patients in the Uppsala Surgical Clinic. Henderson,[4] of the Mayo Clinic, reported that from the years 1917-1927 6 per cent of postoperative deaths occurring in that institution were due to pulmonary emboli. Cleland and Barlow[6] found that during a period of twenty months in the Adelaide Hospital pulmonary embolism was the immediate cause of death in 2.5 per cent of the cases coming to autopsy.

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The time of occurrence, according to Pierson and Wharton[7] is most often in the second or third week. In Nystrom's[8] experience most of the fatal pulmonary emboli occur within the first ten days postoperatively, with a maximum for the fifth day. He also points out the interesting observation of an increase of this complication in the period between 1926 and 1929 for various countries, with a marked peak for the Uppsala clinic in 1928 of 0.8 per cent.

The majority of patients developing this complication were over 50 years of age and it is said to be rare under 30 years. It appears to occur twice as often among private patients as among the ward cases. Nystrom[3] suggests that a certain degree of over-nutrition in wealthy individuals may be the explanation and points out the low incidence of pulmonary embolism in Germany during the World War, an era of marked undernutrition in that country.

A proper perspective of this condition includes several factors which we may refer to as fundamental considerations.

These are: (1) some condition favoring thrombus formation, for example: auricular fibrillation, infectious diseases, operation or trauma.

(2) The efficiency of the pulmonary circulation.

(3) The size of the embolus.

It is not within the scope of this paper to discuss the disturbances in physiology which have to do with thrombus formation other than to mention briefly the type of cases in which intravascular clots are apt to form.

In all cases of heart failure, infectious diseases, following childbirth, postoperative and traumatic cases which exhibit symptoms referable to the cardiac or pulmonary system, such as pain, dyspnea, or collapse, whether mild or severe, emboli should be suspected even though there is at the time no evidence of phlebitis, since such findings may make their appearance later.

Following surgical operations such symptoms are especially apt to have their origin in emboli and critical study has shown that most postoperative pneumonias and pleurisies, for which the anesthetic was formerly blamed, are in reality embolic in origin, especially those occurring after the first three postoperative days.[8] A little unexplained fever in an otherwise smooth infectious disease or postoperative convalescence is most apt to be a venous thrombosis and is therefore a potential source of emboli.

McCartney's[9] observations following trauma showed that pulmonary emboli occurred in 2.8 per cent of males and 8.6 per cent of females. In 80 per cent of these cases the embolism followed injury of the lower extremity, usually a simple fracture. He suggested that the higher incidence of varicose veins in women was an explanation for its more frequent occurrence in females. Pulmonary emboli are said to occur three times more frequently in obese persons than in slender ones.

It should be borne in mind that the injury does not have to be extensive and that emboli may occur following apparently trivial injuries as in the case reported by Paul White in which a phlebitis of the right calf followed a strain while the patient was working in his garden. This phlebitis was the source of a large embolus which almost cost the patient his life.[11]

The second factor of fundamental importance to be considered briefly is the efficiency of pulmonary circulation. In the normal lung it is very difficult to produce infarction experimentally as shown by Karsner,[7] and it is only when the circulation is impaired that infarction is apt to occur. Hence its frequency in congestive heart failure. However, it is not widely appreciated that there is sufficient stagnation in the lesser circuit after operations to set the stage and to make this complication likely. That this is the case is supported by Churchill's and McNeill's[12] experiments on vital capacity in different operations as compared to those in which the peritoneal cavity was opened. They found, by measuring the vital capacity before and after operations, that an operation which did not involve opening the peritoneum had no effect on the vital capacity. On the other hand, any upper abdominal operation was followed by a drop in the respiratory exchange to 25 per cent of its preoperative level; following appendectomy to 50 per cent, and herniotomy to 55 per cent. This state of hypoventilation or partial atelectasis did not clear up for two weeks. They also found that the vital capacity was lowered an additional 30 per cent if a tight abdominal binder was used. The binder was without such effect if there had not been a previous laparotomy.

Overholt,[13] approaching the subject from a different angle, visualized the lungs following laparotomies with the roentgen ray. He was able to demonstrate constant changes in the size and shape of the chest, all of which tended to decrease the respiratory excursion of the chest wall and the diaphragm, and the assuming of a

higher position by the diaphragm, thereby shortening the thoracic cavity. In some asymptomatic cases there was enough atelectasis to throw a shadow on the x-ray plate. Neither the location of the incision nor type of anesthetic appeared to play a causative role.

The third and perhaps most important consideration is the size of the embolus. Small emboli occurring in lungs whose circulation is good produce small lesions limited to the angular borders of the lower lobes. This results in an incomplete infarction exhibiting such symptoms as pleuritic pain, dyspnea, tachycardia, some evidence of shock and in twelve to twenty-four hours a moderate degree of fever.[7] Cough and hemoptysis are usually absent and the physical signs of infarction fail to develop. Unless other or larger emboli occur the patient progresses satisfactorily after several days. However, should the pulmonary circulation be sluggish, infarction results with its physical signs.

It is exceedingly important that phenomena resulting from small emboli be recognized, however mild and transitory these manifestations may be. Such symptoms are emphatic indications for absolute rest and quiet for at least two weeks in an effort to avoid other, possibly larger and even fatal emboli. Repeated attacks of embolism are said to occur in 10 per cent of cases.[14]

Medium sized emboli, particularly in the presence of a sluggish pulmonary circulation, give rise to the above symptoms with the addition of cough and hemoptysis, the pulmonary apoplexy of Laennec. The hemoptysis may be absent, however, even in one-third of the cases and indeed may occur without any sputum at all. There develop, in addition to the above symptoms, signs of infarction usually in the lower lobes as dullness, friction rub, altered breath and voice sounds and rales, especially about the margins of the lesion.[8]

Bland infarctions of moderate size usually clear up in about two weeks. Larger ones may take much longer to be absorbed. Infected emboli, or a pre-existing infection in the lungs, greatly increase the danger of suppuration and often result in abscess or gangrene, sequelae adding greatly to the gravity of the condition.

The x-ray is of valuable assistance in reaching a diagnosis and differentiating other lesions such as pneumonia and pleural effusions.[7] With small emboli and physical signs meager or absent, a careful search and correct interpretation of slight shadows, especially in the costophrenic angles, will often confirm an otherwise presumptive diagnosis. More definite shadows render the diagnosis more easily positive.

Emboli of sufficient size completely to block the pulmonary artery quickly cause death because blood does not reach the left ventricle and therefore there is an absence of blood to the brain.[15]

A large embolus incompletely blocking the main artery presents a tragic picture, comparable to coronary occlusion or dissecting aneurysm, from which it must be differentiated.

In such cases of massive embolism the onset is sudden with evidences of shock, a rapidly mounting feeble pulse, perhaps ashen pallor, though more often there is marked cyanosis and low blood pressure. Substernal oppression is present alone or associated with dyspnea, but there is rarely present the prolonged agonizing pain seen in coronary occlusion. Hemoptysis has been reported at times with frothy sputum but bloody sputum is more common after some hours or a day or so as a manifestation of infarction. Neurologic symptoms[16] as hysteria or convulsions may be present, and are explained by the relative cerebral anoxemia. Hampton and Wharton[17] have reported cases in which abdominal tenderness, distention, and vomiting dominated the picture. Nystrom[3] reported a case upon which he operated, found no embolus in the pulmonary artery, but found that the symptoms were due to rupture of an abscess into the peritoneal cavity following operation for incarcerated umbilical hernia. Physical examination of the lungs for twelve or twenty-four hours and possibly longer after embolism of the pulmonary artery reveals no definite findings, though a high position of the diaphragm by x-ray is suggestive.[11]

Massive embolism causing a high degree of obstruction to the pulmonary artery throws a sudden severe strain upon the right heart, causing it to dilate. In the occasional instance in which this does not occur, it is believed that shock and vasomotor collapse lower the venous pressure and thus remove the strain usually present. Symptoms and signs indicating dilatation of the right heart under such circumstances have been recognized by Paul White and his associates and called the "acute cor pulmonale." The condition is said by them[16] to be indicated by the following findings:

"Pulsation and increased prominence in second and third interspace just to left of sternal border due to an over-active pulmonary artery and conus. A systolic murmur may be present over this area and a loud P 2 is present unless the obstruction is too great. A friction

rub in the same location is often present, usually to and fro, but maybe only systolic, probably due to the dilated pulmonary artery and conus impinging on the anterior thoracic wall.

"A diastolic gallop may be heard along the left sternal border. Dilatation and increased pulsation of the jugular veins is usually present and cyanosis is in contrast to the pallor of coronary thrombosis.

"The signs of acute cor pulmonale may last from a few hours to days or until death or recovery takes place. Within twenty-four hours after onset, fever and a leukocytosis occur and usually also signs and symptoms of infarction of the lung appear. A phlebitis, the source of the embolus, may be found at the time of the accident, its presence may have been known previously or it may make its appearance later."

Nystrom quotes Crafoord, who observed a gradual increase in percussion dullness of four or five centimeters beyond the usual right border which he says indicates dilatation of the right heart in massive embolism.

No x-ray examinations have yet been made of this condition owing to obvious difficulties, but they will no doubt give supporting evidence of the dilated pulmonary conus and right heart.

The electrocardiographic records[18] in these cases are those of the so-called coronary T3 type. That is, lowering, flattening or slight inversion of T2, wide or deep S waves in lead 1, and inversion of QRS-3. In lead 4 an upright T with relatively normal P and QRS waves, which differs from lead 4 of coronary thrombosis of either T1 or T3 types and is in agreement so far as the T wave is concerned with lead 4 in mitral stenosis or the tetralogy of Fallot, where the right ventricle is known to be enlarged. Tracings made after recovery show a return to normal of these changes.

Time will permit only mention of the attempt to relieve this condition by the daring and spectacular Trendelenburg operation, first successfully accomplished by Kirchner and later simplified by Meyer.[3 14] There are already ten successful cases on record. It is probable that many lives may be saved in the future that would otherwise be lost, as more of our experienced surgeons master the technic.

The following case illustrates fairly typically a severe case of pulmonary embolism with evidences of dilatation of the right heart, "the acute cor pulmonale," and the development of phlebitis of the leg, which was no doubt the source of the embolus, making its appearance some time after the pulmonary accident.

Mr. H. M. C., white, male, aged 57 years, blood pressure 140/100, blood chemical, urine, and other examinations all within normal limits. He was operated upon by Dr. J. J. Ravenel June 11, 1935, who did a transurethral resection of a benign hypertrophied prostate. He did well and was discharged on the seventh day.

On July 15 he re-entered the hospital with fever and chills, leukocytosis, pyuria and a blood pressure of 132/80. On August 9, his temperature having been normal five days, he raised up in bed and was seized with marked respiratory distress and substernal oppression. His pulse rose quickly to 145, he was cyanotic, in a profuse cold sweat and the blood pressure fell to 95/75. The neck veins were prominent and pulsating. On examination P2 was markedly accentuated and a soft to and fro friction rub synchronous with the heart beat was heard in the third left interspace. In twenty-four hours evidences of infarction could be found. There was a pleuritic pain in the right chest. He began coughing thick bloody sputum and there was an increase of leukocytes to 21,000 with 81 per cent polynuclears. This progressed until the friction rub was audible over the entire right chest below the lever of the third rib anteriorly.

His progress was satisfactory, but slow. A portable film of the chest on October 1 was reported as showing a roughly circular area of clouding of the lower portion of the upper and most of the middle lobe of the right lung. This gradually cleared up completely. However, on September 29, he developed well marked evidences of phlebitis in the left thigh and considerable apprehension was felt over the possibility of another embolus, but fortunately it did not occur.

The electrocardiogram taken three or four hours after the onset of symptoms showed changes which, while not so marked as those reported, do tend to fulfill the criteria of White and also Barnes. S1 is moderately prominent, T2 is only about the same height as P2, ST3 tends towards an elevated take-off and T3 is flattened and at times appears to tend to inversion. About five weeks later S1 is still present, T2 still rather low voltage, but in lead 3 there is no tendency to an elevation of take-off of ST and the T wave is distinct and positive. It is unfortunate that the Woolferth fourth lead was not taken. It has been pointed out by both White and Barnes that it differs from that of coronary occlusion in that the T wave is upright, and it might have been more definite in indicating an obstructing embolism.

CONCLUSIONS

An attempt has been made to outline some of the more important features of embolism occurring in the pulmonary artery and its branches. A case of massive embolism of the pulmonary artery is reported. These findings indicated a marked acute strain on the right heart, the so-called "acute cor pulmonale." It was followed by a large infarction of the lung and the subsequent development of phlebitis of the leg.

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DISCUSSION (*Abstract*)

Dr. Louis Hamman, Baltimore, Md.—Dr. Cannon has presented very satisfactorily the general clinical features of pulmonary embolism. I have nothing important to add, but will comment briefly upon four points.

(1) It is well known that in healthy persons pulmonary embolism is not followed by infarction. This fact is important in diagnosis, since at times the diagnosis of pulmonary embolism is missed because the physician looks in vain for the signs of pulmonary infarction. There is a difference between clinicians and pathologists in the definition of pulmonary infarction. To the pathologist, infarction implies destruction of tissue which, if it does not become infected, is absorbed and replaced by a scar. Following pulmonary embolism the clinician may observe consolidation of a lobe of a lung which gradually resolves, leaving the lung structurally and functionally as it had been before. Three months later it may be impossible to discover on physical and roentgen ray examination any evidence whatsoever to indicate which lobe had been consolidated. The consolidation was undoubtedly due to hemorrhage into the alveola, but there was no destruction of tissue (possibly due to the circulation maintained through the bronchial artery) for when the hemorrhage is absorbed the lung functionally is restored. Strictly speaking, this is not infarction, but we are accustomed to call it infarction, and it is convenient to do so. Smaller areas of hemorrhage into the lung occur frequently in chronic passive congestion when there is no pulmonary embolism. These pools of blood are a common cause of blood spitting, for instance in mitral stenosis. Using the term infarction as we do, clinically we must recognize three varieties: (a) the congestion infarct which occurs with chronic passive congestion in the absence of pulmonary embolism; (b) the large extravasations of blood which follow pulmonary embolism, but without destruction of tissue; (c) the true infarct with destruction of tissue, necrosis and replacement with a scar.

(2) Small pulmonary emboli are frequently misinterpreted and the symptoms ascribed to some other cause. This occurs now much less often than formerly. For instance, following operation the diagnosis of pulmonary embolism is more and more frequently made and the diagnosis of pleurisy and pneumonia less frequently. The recognition of small pulmonary emboli is important, since it is probable that great care may prevent the occurrence of larger, fatal emboli.

(3) The diagnosis of large pulmonary emboli is sometimes difficult. It has been pointed out again and again how closely the symptoms may resemble those of coronary occlusion. When the left lower lobe is infarcted a to and fro rub over the heart may develop, indistinguishable from a true pericardial rub.

(4) Death from pulmonary embolism is a cardiac death. Experimentally it has been shown that animals survive ligation of one of the two main branches of the pulmonary artery. The pressure in the pulmonary circulation rises and the pressure in the aorta falls, but after a short time these differences are readjusted. In man, sudden death always occurs when both main branches of the pulmonary artery are occluded, a condition due nearly always to a large embolism straddling the bifurcation. When one main branch is occluded, (a) death may occur instantly, (b) the signs of heart failure may come on and death occur hours or days after, or (c) the patient may recover from the immediate symptoms of the accident and after months or years die of myocardial failure, the heart at autopsy showing great enlargement of the right ventricle. Therefore, the immediate results of large pulmonary emboli depend in great measure upon the condition of the heart and the efficiency of the circulation. The term *acute cor pulmonale* has been introduced recently to denote the reaction of the heart to sudden increase of pressure in the pulmonary artery. For this purpose it may be a convenient term, but physicians must understand that, although the term is new, the mechanism it designates has long been understood and described.

Dr. Cannon (*closing*).—Why some of these patients should exhibit pallor and others cyanosis as recorded by different observers is most interesting.

Churchill and Gibbon have attempted to find an explanation for this and I quote their conclusions published in the *Annals of Surgery* (104:811-822, Nov., 1936), which came to my notice as I was leaving for this meeting.

"These experimental observations point the way to a clearer understanding of the symptoms of pallor, air hunger, etc., which has been observed in patients with massive pulmonary embolism. The 'syncopale' type observed by Rochet would correspond to an experimental occlusion of the main pulmonary artery. The 'asphyxique' type corresponds to the experimental occlusion of the larger branches of the pulmonary artery.

"From the experimental evidence the following presumptions seem justified. Where symptoms of pallor and lowered blood pressure predominate in a patient suffering with pulmonary embolism, the embolus produces the greater degree of obstruction in the pulmonary artery or at or above the point of bifurcation.

"Where cyanosis is a prominent feature and the lowering of the blood pressure is slight or absent, the embolus blocks at least one main branch of the pulmonary artery, and possibly some of the smaller branches of the other. More exact conclusions might be reached by determining the percentage saturation of arterial blood with oxygen. Finally, oxygen inhalations may be a life-saving measure where there is marked diminution in the pulmonary vascular bed, and hence should certainly be given in all cases with the slightest evidence of cyanosis.

"The respiratory changes occur in both types of obstruction and, although perhaps more marked with occlusion of the peripheral vascular bed, the difference is not great enough to be significant. The increased depth of respiration, however, remains an important diagnostic feature in all cases of massive pulmonary embolism. Elevation of the venous pressure regularly occurs with the obstruction of the main pulmonary artery.[9]

"On two occasions the venous pressure was measured in the peripheral type of obstruction. In one instance there was an increase of 10 mm. water pressure with 86 per cent occlusion, and in the other no change was observed with 73 per cent occlusion."

THE DIAGNOSTIC VALUE OF VENOUS PRESSURE DETERMINATIONS IN CERTAIN DISEASES*

By RUFUS D. MOORE, JR., M.D.
Little Rock, Arkansas

Venous pressure determinations date back over 200 years. The first measurements were obtained by the Rev. Stephen Hale,[7] who inserted a glass tube directly into the jugular vein of an old mare. This was done in the year 1733. It was not until 1905 that clinical applications were attempted with the introduction of indirect methods.

Frey measured the venous pressure by rendering a vein anemic by the pressure of a bulb connected with a manometer. Being grossly inaccurate the method was abandoned. Likewise unsatisfactory was Gartner's method based upon the height to which it was necessary to raise the arm in order to collapse the dorsal veins of the hand. The difference between the level of the hand and the level of the right auricle (taken as the fourth rib) represented the pressure in the auricle in centimeters of water. The methods of Sahli and von Recklinghausen employed the same principle. Von Recklinghausen's apparatus consisted of a bulb having windows on opposite sides. The bulb was applied to a vein and inflated until the vein collapsed. This could be controlled visually through the windows and the pressure read on a water manometer. Hooker and Eyster devised a more refined apparatus working on the same principle and further modifications were introduced by Brams, Katz and Schutz and Worth Brown.[8 10]

The direct method was first applied to determine venous pressure in man by Moritz and von Tabora[7] in 1910. Their apparatus, variously modified, appears to be most in vogue at the present time.

The physiological factors which influence the venous pressure have been recently reviewed by Wiggers,[10] who, with Clark, Hooker and Weed,[2] point out the intrinsic limitations of all methods of measuring venous pressure. Among the studies of venous pressure under pathological conditions are those of Eyster,[4] Berghausen[1] and Conti.[3] It suffices for our purpose to point out that basal conditions at the time of making the determination should be approached as closely as possible. The patient should be at complete rest in the recumbent position. Forced respiratory movements with the glottis closed should be avoided. Under these conditions the venous pressure normally stabilizes in the region of 60 to 80 mm. of water with an occasional upper limit of 110 mm.[10]

In the present study an attempt was made to extend existing data and to learn if possible some of the diseases in which changes in venous pressure might be sufficiently precise to have real clinical value. The material consisted of 150 cases with a total of 500 determinations. There were 35 normal individuals and 115 with a variety of conditions, including congestive heart failure, pericarditis, essential hypertension, ascites, bronchial asthma, and heart disease without decompensation. All venous pressures were obtained by the direct method, using the apparatus of Griffith, Chamberlain and Kitchell.[5] The results of our observations are tabulated in *Fig. 1.*

Thirty-five patients in whom no evidence of circulatory disease could be found had average venous pressures of 91 mm. of water with extremes of 68 and 126 mm.

Among the pathological cases the highest readings were obtained in congestive heart failure regardless of the etiology. In none was the venous pressure below 210 mm. of water. The maximum was 340, the average 244 mm. Repeated determinations on individual cases showed that clinical improvement was always marked by a fall in venous pressure. When the heart disease was of the hypertensive type the fall in the venous pressure was accompanied by a rise in the arterial pressure.

Pericarditis, regardless of the type, invariably gave markedly elevated venous pressures, which fell, however, below the lower limits observed in congestive heart failure. The average was 195, the minimum 180 and the maximum 208. In acute infectious processes such as pneumonia in

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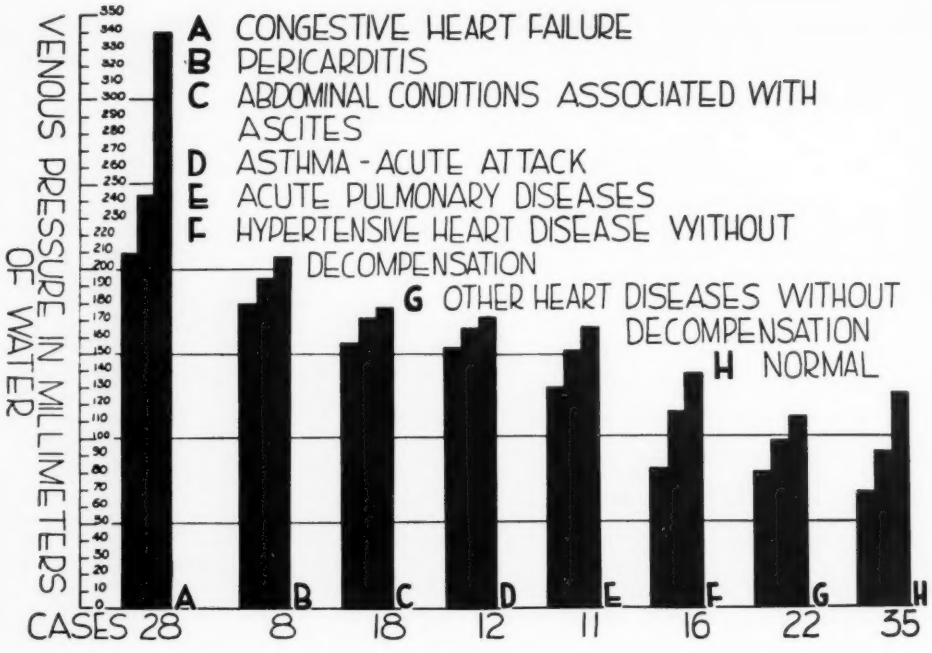
VENOUS PRESSURE IN MILLIMETERS OF WATER
A CONGESTIVE HEART FAILURE
B PERICARDITIS
C ABDOMINAL CONDITIONS ASSOCIATED WITH ASCITES
D ASTHMA - ACUTE ATTACK
E ACUTE PULMONARY DISEASES
F HYPERTENSIVE HEART DISEASE WITHOUT DECOMPENSATION
G OTHER HEART DISEASES WITHOUT DECOMPENSATION
H NORMAL
CASES 28 8 18 12 11 16 22 35

Fig. 1

which a pericarditis was suspected, it was possible to confirm or rule out this cardiac complication with some degree of certainty provided there was no evidence of associated cardiac failure. In the latter event the venous pressure fell into the much higher range of decompensation (see *Fig. 1*).

Twelve cases of bronchial asthma were observed during an attack. The average pressure was 166 mm. (limits 154 to 172 mm.). To each patient 1 c. c. of epinephrine hydrochloride was given immediately and the relief of the respiratory distress which followed was accompanied by an average reduction in the venous pressure of 48 mm. It is noteworthy that during the attack the venous pressure, though high, was well below the level observed in cardiac decompensation, a fact that will be referred to below.

In a case of hysterical dyspnea the venous pressure was within normal limits.

In pneumonias, the venous pressure was only moderately elevated, and the values varied roughly with the degree of involvement (average 152, maximum 166, minimum 130 mm.). The observation that serial determinations give the earliest evidence of cardiac failure was confirmed.[6] As far as one could conclude from a small number of cases, a falling venous pressure was a good prognostic sign when the clinical aspect of the patient seemed unsatisfactory. It did not appear, however, that the intrinsic value of these facts justified serial determinations as a routine procedure.

Compensated hypertensive heart disease gave average pressures of 116 mm. (limits 82 to 138 mm.) confirming the observation that arterial hypertension is associated with slightly elevated venous pressure.[9] Compensated heart disease of all types showed essentially normal values (average 94 mm.).

Cases of ascites of non-cardiac origin, with and without generalized anasarca, remain which we believe are significant as pathological controls. In most of them the diagnosis was in doubt at the time the venous pressures were taken and the values obtained aided in directing the investigation of the etiology into proper channels. The pressures were, contrary to the findings reported by some authors,[6] moderately elevated (158 to

178), but much below those observed in cardiac decompensation. The venous pressure was elevated in a similar manner by the pregnant uterus.

In one case of pre-eclamptic toxemia with much edema the venous pressure was 178 mm.

DISCUSSION

During the past twenty years the importance of venous pressure determinations as a diagnostic procedure has been frequently emphasized, but it must be recognized that practical results have not been impressive. The limitations are founded upon the technic available and upon the susceptibility of the venous pressure to influences which are uncontrollable. All of the indirect methods are too complicated or too unreliable for routine clinical use. The direct method, although convenient and accurate, involves venipuncture and can scarcely be employed repeatedly in a given case unless the information to be obtained is of crucial importance. For these reasons the conditions under which venous pressure determinations can serve a real purpose should be clearly established. To further the solution of the problem we offer the following conclusions which simply represent our personal experiences.

CONCLUSIONS

A graphic consolidation of venous pressure determinations in 150 cases of varied nature shows that critically high venous pressures occur only with cardiac decompensation and that as a consequence the clinical application of venous pressure must be largely confined in practice to the differentiation of cardiac decompensation from other clinical states. It has been found valuable:

(1) As confirmatory evidence in suspected incipient cardiac failure.

(2) In establishing the degree of cardiac participation in the production of edema or of ascites, especially in certain complex cases where the distribution of the edema is atypical.

(3) As an aid in unmasking a pericarditis or other cardiac lesion complicating an acute infectious disease.

(4) In determining quickly and certainly the general cause and in orienting the treatment in cases of acute respiratory distress such as occurs in cardiac asthma, bronchial asthma and hysteria.

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CAUSES OF HYPERTENSION IN YOUNG INDIVIDUALS, WITH SPECIAL REFERENCE TO COARCTATION OF THE AORTA*

CLINICAL REPORT OF A CASE

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The presence of high blood pressure, regardless of cause, always provokes apprehension. Particularly is this true in young individuals, who have the majority of their life's span ahead of them. They are just entering the struggle which requires a maximum of effort from all. The older person may already have won his position in life and be able to live out his life's expectancy quietly, even though his blood pressure is not normal. Youth, on the other hand, is the period of activity, and high blood pressure in this age period should spur us to our greatest efforts to discover its cause and alleviate it, if possible. All too often, however, we find it impossible to afford much relief, even though the cause may be determined. Nevertheless, the few instances in which proper management or therapy may afford relief more than justify the effort which might be termed "wasted" on others.

It is needless for me to emphasize that in taking blood pressure readings on young patients the examiner must evaluate and minimize emotional factors. The badly frightened patient's pressure will always be higher than his normal. Even in older patients, it is often true that if the pressure is recorded three times on each patient at intervals of a few minutes with the intervening time consumed in conversation designed to gain confidence and allay fear there will be a difference of five to twenty points in such readings, the last reading usually being the lowest. The present consideration of the subject given above presupposes that the pressure is truly

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abnormal and that emotional factors or recent exertion are not responsible for apparent hypertension.

In all probability, the greatest cause of hypertension in early adult life is chronic nephritis. Acute nephritis, in the initial attack, often does not cause hypertension. Acute exacerbations of chronic nephritis do cause such an elevation. Often there will be no symptoms particularly referable to the kidneys. The presenting complaint may be failure to grow, failure to gain or loss of weight, general weakness, pallor and headache. Or the symptoms may be referable to the cardiorespiratory system, namely, palpitation, dyspnea or dependent edema. Examination of the urine will usually show albumin, casts and cellular elements, but if the time of the examination is sufficiently removed from the last exacerbation, the urine may, on a single examination, be negative. One should, therefore, always resort to repeated examinations and also to kidney function tests and eye ground study. A carefully done ophthalmoscopic examination through well dilated pupils by a competent observer will give us an excellent guide as to the state of the vascular tree and in chronic nephritis will often show exudates which are quite characteristic. Many tests for kidney function have been devised and each one has some value, but when all is said and done, the ability of the kidneys to concentrate and dilute urine is our best guide. Early recognition and proper treatment of chronic nephritis by removal of foci of infection, proper diet and prolonged rest may result in a restoration of kidney function and a consequent fall in blood pressure and prolongation of useful life. Chronic nephritis, therefore, as a cause of hypertension should be constantly borne in mind when we are considering young patients. Congenital polycystic kidneys may occasionally be found accountable for an otherwise unexplained hypertension. The symptoms and the mechanism of the hypertension are essentially the same as accompanying a chronic nephritis. In addition, of course, one may often palpate the abnormal kidney masses or demonstrate the exact lesion by pyelogram.

In young individuals, we occasionally also may encounter instances of complete heart block, due either to diphtheria, rheumatic infection, other types of infection or to congenital lesions affecting the interventricular septum. Accompanying such complete heart block there is uniformly an elevation of the blood pressure. This will be chiefly noted in the systolic pressure and the pulse pressure will be relatively large. Such a cause for elevated pressure would of course be easily detected. Furthermore, such an occurrence is quite rare and deserves no further comment here. Another example of hypertension associated with a high pulse pressure is that accompanying a free aortic insufficiency. It has previously been observed[3] that this form of hypertension is one of the common causes of "dynamic dilatation" of the aorta. Of course the interpretation of the cause of this form of hypertension is clearly indicated by discovering the valve lesion.

No discussion of hypertension in youth is complete without a consideration of syphilis as an etiologic factor. Many authors, years ago, attributed much of hypertension to this cause. In recent years, however, the majority have felt that syphilis plays no part in causing blood pressure elevation. In the main, this latter statement is undoubtedly true. It is likewise undoubtedly true, however, that in rare instances of diffuse syphilitic endarteritis with extensive involvement of the arterioles and finer arteries, such as Derick and Hass[1] have recently described, syphilis may be the basis for a hypertension. Needless to say, our therapeutic aim in the face of such a possibility should be the early and adequate treatment of all cases of syphilis. Levine[4] has also called attention to rheumatic fever, typhoid fever and lead poisoning as other examples of diffuse disease of the smaller arteries and as occasionally the cause for a hypertension.

Various ones of the glands of internal secretion have at times been incriminated as the causes of hypertension. Undoubtedly a number of these glands may play a part in influencing blood pressure. Hyperthyroidism, during the phases of activity, usually causes an elevation of the systolic pressure and occasionaly the readings are quite high. The various other clinical features which accompany this syndrome serve, however, to indicate the proper diagnosis and treatment. Of interest likewise are the rare cases of essential hypertension which finally are found to be due to an adenoma of the adrenal glands. The literature contains numerous references to autopsies in such cases. Lastly, among the endocrine causes of hypertension, I should like to mention basophilic adenomas of the pituitary. The syndrome which accompanies such adenomas has been termed "Cushing's syndrome"[2]

because he crystallized it from a mass of varied symptoms. He has collected and reported a series of cases where hypertension and certain other symptoms to be described later were due to small basophilic-staining adenomas of the anterior pituitary. He likewise has studied a number of cases of so-called essential hypertension and eclampsia which showed rather striking basophilic infiltration. He has, therefore, been inclined to feel that this infiltration might be the cause of essential hypertension. The work which he has done in an attempt to prove the causal relationship between basophilism and hypertension in a variety of clinical conditions is interesting and stimulates much thought. The evidence is as yet incomplete. His contribution to the subject, however, is definite in that the so-called Cushing's syndrome is now a definite clinical entity which has the following characteristics: there is a rapidly developing obesity, the majority of the fat accumulating in the trunk, particularly the abdomen, the extremities remaining relatively unchanged. Amenorrhea usually develops in the female and decreased sexual function in the female, who may often develop a heavy beard. A deep cyanosis is usually accompanied by a true polycythemia with red blood count often as high as 7,000,000. Multiple purpuric striae are demonstrable over the abdomen, buttocks and thighs; the urine shows an albuminuria and in fact the clinical picture has often been mistaken for chronic nephritis. The bones undergo softening with development of deformities, particularly in the spine, possibly causing a marked loss in height. The blood calcium is usually slightly elevated. X-rays of the bones show a typical granular decalcification, somewhat similar to that seen with osteitis fibrosa cystica, but showing no evidence of cyst formation. X-rays of the pituitary fossa usually show no abnormality. Though characteristic and marked examples of this syndrome are not common, they are sufficiently common to occur within the practice of every one who sees a reasonable number of patients. There are undoubtedly, in addition to the examples of classical Cushing's syndrome, many borderline cases where the pituitary is probably at fault.

Finally, there is one other cause of hypertension in youth which I want to mention: that is coarctation of the aorta. In one sense of the word, it is perhaps the most important, for certainly of the various causes it is the one most overlooked. In the adult form of this congenital anomaly, there is a narrowing or complete closure of the aorta at a point just distal to the arch in the region where the ductus arteriosus attaches. The best single lead in arriving at the diagnosis clinically is the finding of an elevated blood pressure in a relatively young individual. For detailed descriptions of the clinical and x-ray findings, one should consult the writings that deal exclusively with this subject. Abbott[5] and Blackford[6] have made valuable contributions. X-ray findings have been elaborated by Railsback and Dock[7] and by Fray.[8] Many others have reported individual cases or small groups of patients. Robert and I[9] recently reported two cases. I wish to report one additional case, which serves again to illustrate the clinical findings.

A white boy, aged 19 years, was referred to me by Dr. W. H. Parsons on July 22, 1935. He complained of dizziness, blurring of vision and flushing of the face of three and one-half years' duration.

His family history was essentially irrelevant. His past history revealed that he had the usual childhood diseases without complications. There was no history of diphtheria, scarlet fever, rheumatism, chorea or recurrent sore throat. His tonsils had been removed at the age of 14½ years. He had a rather prolonged attack of malaria at the age of 11 years, but apparently recovered without sequelae. He had always been quite active and enjoyed athletic sports of all types.

He was apparently well until October, 1932. One day, while traveling to a football game, he suddenly became nervous, had a sensation that blood was rushing to his head. His breathing was difficult, he had marked apprehension and almost leaped from the automobile. In a few minutes this attack subsided and he participated in the football game as planned. A few weeks later, while walking across the porch, he experienced the same sensation. Subsequenty attacks of a similar character have occurred at irregular intervals. During three months of rest in bed he had no attacks, but continued nervous and his blood pressure at that time was found to be 180 systolic and 100 diastolic.

Examination showed his general nutrition to be good. His temperature, pulse and respiration were normal. His mental state was normal. General examination was negative except as listed below.

There was a marked pulsation of both carotid arteries. There was no tracheal tug. The cardiac impulse was rather diffuse, being best localized in the fifth interspace, nine centimeters to the left of the midsternal line. There was also an unusual pulsation in the left third and fourth interspaces close to the sternum. Palpation revealed no thrill. Auscultation showed the heart action to be regular, rate 86 per minute. A systolic murmur (grade 3 minus) was heard at the apex. A rough systolic murmur (grade 3 plus) was heard in the pulmonic area and well transmitted out toward the left infraclavicular region. Auscultation over the chest posteriorly showed loud systolic bruits in both interscapular regions at the level of the scapular spine. A faint sys-

tolic bruit could also be heard over the left tenth and eleventh ribs posteriorly. The lungs were normal. No pulsations could be felt in the abdominal aorta and only very weak pulsation in the femoral arteries. Popliteal and dorsalis pedis pulsations were absent. The blood pressure reading in the right arm was 158 systolic and 90 diastolic. No reading of blood pressure could be obtained in the right leg and on the left it was 90 systolic and 70 diastolic. Routine blood and urine examinations showed no abnormality. Electrocardiogram showed normal curves except for sinus arrythmia. An x-ray of the chest showed the lungs to be clear. The heart was globular, apparently moderately enlarged. The aortic knob was conspicuously absent. There was slight though definite notching of the under surfaces of the right third, fourth and fifth ribs posteriorly. Fluoroscopy of the chest showed that pulsations of the ascending aorta were quite forceful. In the oblique view the ascending and descending aorta were well visualized, but there was an intervening segment where no aortic shadow was seen and no pulsation detected.

The patient presents then a picture of hypertension in the cephalic portions of the circulation along with evidences of collateral circulation in the thorax and of relatively poor pulsation and low blood pressure in the abdominal vessels and those of the lower extremities. This picture, plus the pathognomonic characteristic notching of the under surfaces of the ribs, conclusively establishes the diagnosis of this patient.

We have seen above that there are a variety of causes for hypertension in young individuals and that many of these may be detected. However, it occasionally occurs that after we have carefully considered our patients from the standpoint of all known causes, there will remain a certain small number for whose hypertension we can find no cause. For the present we must class these as having essential or idiopathic hypertension. In so doing, of course we only admit our ignorance. Just as coarctation and basophilic adenomas of the pituitary have come to the front in the past few years to explain some of our essential hypertension, so likewise may other causes develop in the future. I feel that careful attention to the various glands of internal secretion is most likely to offer further evidence of what we now term essential hypertension.

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THE INCIDENCE OF MAJOR AND MINOR ALLERGY IN THE DEEP SOUTH*

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The separation of allergic individuals into two groups was undertaken by Vaughan[1] in 1934. Basing his conclusions upon personal observations and two amnesic surveys, he originated the distinction between and definition of major and minor allergy. He describes the major or frank allergic as the unfortunate individual who becomes sensitized to a food, foods, or substance with which he comes into frequent or daily contact and which he cannot identify. This group is that which comprises most previous allergic surveys and has been consigned to from 7 to 10 per cent of the population at large. Allergic manifestations attributable to this group are limited particularly to asthma, hay fever, urticaria and migraine. The minor allergic Vaughan calls fortunate because this person becomes sensitive to something with which he comes into only occasional contact, recognizes a cause and effect immediately and thus finds no difficulty in controlling his allergy.

Vaughan concludes from this study that:

"Upward of 10 per cent of the population develop major allergic manifestations, usually subacute or chronic in character. Approximately an additional 50 per cent give a history of minor episodic allergic manifestations in the past.

"The latter are usually sensitive to allergens with which they come into only occasional contact while the former, in addition, are sensitized to stable allergens with which they come into frequent, often daily contact.

"The difference between the two groups depends chiefly upon the degree and frequency of contact with the offending allergen. Recognition of the allergen depends upon this and determines into which class the individual will fall."

He considers urticaria, diarrhea, colitis, sneezing, eczema, rash, headache, itching, chest pains and such dyspeptic manifestations as nausea, vomiting, heartburn, belching, gas, cramps and after taste as minor allergic examples when a cause and effect correlation had been observed between possible factors and symptoms. Vaughan also includes angioneurotic edema in this list.

The present report is based on an amnesic

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1. Vaughan, W. T.: Minor Allergy: Its Distribution, Clinical Aspects and Significance. Jour. Allergy, **4**:184, 1934.

survey covering 700 persons. The individuals questioned were residents in and about the town of Jackson, Louisiana, secondary school children of Baton Rouge, Louisiana, and summer school students in the Louisiana State University at Baton Rouge, Louisiana. The survey was conducted with the assistance of three school teachers, two of whom are major allergics, who undertook canvassing of the secondary school rooms and a minor portion of the small town population. The university summer school students were interviewed over a period of three months by a student who spent with it much time and consideration.

From this study it was found that 95 of the individuals out of 700 were without doubt seriously afflicted with allergy, representing 13.6 per cent. They were major allergics. No person was interpreted as a frank or major allergic unless he described symptoms of major proportions, most frequently necessitating professional attention of some sort, whether by a specialist or a general practitioner. Forty-two, or 44.2 per cent, were males, and 53, or 55.8 per cent, were females.

Of the remaining 86.4 per cent, 217, or 35.8 per cent, described manifestations of minor allergy. Ninety-four, or 43.3 per cent, were males, and 123, or 56.7 per cent, were females.

It was found that among the major group the following frequency of symptoms was mentioned: hay fever 59 times, asthma 39, migraine 25, urticaria 30, eczema 10, angioneurotic edema 1 time, and colitis 1 time. It is interesting to note that only 21 factors were mentioned 41 times by these sufferers as contributing to their particular allergic malady or combination of allergic maladies. Among this number 12 were foods, 7 were inhalants and 2 were drugs. The foods and drugs mentioned were in order of frequency: strawberry, cabbage, quinine, watermelon, cantaloupe, beef, bacon, aspirin, tomato, pecan, coconut, walnut, peanut and celery. The inhalants mentioned in order of frequency were dust, pollen, feathers, chalk dust, face powder, cotton, and smoke from boiling rice. None of these factors was denoted as playing a major causative role; they were simply listed as bringing about more trouble. The number of times mentioned and the manifestations arising therefrom are tabulated in *Table 1*.

It was found that among the minor group symptoms were mentioned in the following frequency: indigestion 108 times, urticaria 46 times, eczema 46 times, migraine 14 times, hay fever 5 times, asthma 3 times, colitis 1 time, and angioneurotic edema 1 time.

Table 1

MAJOR GROUP, SHOWING FACTOR AND SYMPTOM CORRELATION

Factor	Symptom					
	Asthma	Hay Fever	Migraine	Eczema	Urticaria	Colitis
Foods						
Strawberry				1	2	1
Cabbage	1		2			
Watermelon			1			1
Cantaloupe		1	1			
Beef			1			
Bacon			1			
Tomato				1		
Pecan	1					
Coconut	1					
Walnut		1				
Peanut			1			
Celery			1			
Drugs						
Aspirin				1		
Quinine			1	1		
Inhalants						
Dust	4	5				
Pollen	3	2				
Feathers		1				
Chalk dust	1					
Face powder						
Cotton		1				
Rice smoke	1					

The percentages of frequency of symptoms alone and in combination of both major and minor groups are seen illustrated in *Table 2*.

In every case of minor allergy the sufferer was able to point out a definite causative factor or definite causative factors whether ingestants, inhalants or contactants. He could thus relieve his allergy by conscious avoidance of a known substance. In this group foods mentioned exclusive of indigestion, were in order of frequency strawberry, tomato, watermelon, banana, chocolate, pork, beet, peach, shrimp, orange, butter, cream, milk, fig, lemon, cheese, sugar, egg, cream cheese (cottage cheese), mackerel, crab, oyster, coffee, coca-cola and onion. Drugs mentioned in order of frequency were quinine, aspirin and calomel. Inhalants mentioned were chalk dust, house dust, cow feed and face powder. Contactants were wool, peach down and dried pea. Twenty-five foods were mentioned 169 times; 3 drugs were mentioned 14 times; 4 inhalants were mentioned 11 times; and 3 contactants were mentioned 5 times.

Table 2

SHOWING THE PERCENTAGES OF FREQUENCY OF SYMPTOMS ALONE AND IN COMBINATION OF BOTH MAJOR AND MINOR GROUPS

	Town		Secondary School		College		Total Per Cent	
	Per Cent Major	Per Cent Minor	Per Cent Major	Per Cent Minor	Per Cent Major	Per Cent Minor	Major	Minor
H	9.60	1.60	.72	0.00	3.72	1.01	3.57	.71
A	4.80	.80	1.43	.36	2.36	0.00	2.43	.28
M	5.60	3.20	0.00	0.00	0.00	1.01	1.00	1.00
U	3.20	7.20	.72	5.02	1.69	2.70	1.57	4.43
C	0.00	0.00	0.00	0.00	0.00	.34	0.00	.14
E	0.00	4.00	0.00	3.23	0.00	6.08	0.00	4.57
I	0.00	25.60	0.00	10.75	0.00	18.24	0.00	16.57
HA	0.00	0.00	.72	0.00	2.03	0.00	1.14	0.00
HM	1.60	0.00	0.00	0.00	.34	0.00	.43	0.00
HU	.80	0.00	.36	0.00	.34	0.00	.43	0.00
HE	.80	0.00	0.00	0.00	.68	0.00	.43	0.00
HI	0.00	0.00	0.00	0.00	1.35	0.00	.57	0.00
HAM	2.40	0.00	0.00	0.00	0.00	0.00	.43	0.00
HAU	0.00	0.00	0.00	0.00	.34	0.00	.14	0.00
HMI	1.60	0.00	0.00	0.00	0.00	0.00	.28	0.00
HMU	.80	0.00	.36	0.00	0.00	0.00	.28	0.00
HUE	0.00	0.00	0.00	0.00	.34	0.00	.14	0.00
HEI	0.00	0.00	.36	0.00	.68	0.00	.43	0.00
HMIE	0.00	0.00	0.00	0.00	.34	0.00	.14	0.00
AM	0.00	0.00	.36	0.00	0.00	0.00	.14	0.00
AU	.80	.80	1.08	0.00	.34	0.00	.71	.14
AI	0.00	0.00	0.00	0.00	1.01	0.00	.43	0.00
AC	0.00	0.00	0.00	0.00	.34	0.00	.14	0.00
MI	0.00	0.00	.36	0.00	.68	.68	.43	.28
ME	0.00	0.00	0.00	0.00	.34	1.01	.14	.43
MU	.80	.80	0.00	.36	0.00	0.00	.14	.28
EI	0.00	0.00	0.00	.36	0.00	2.70	0.00	1.29
EU	0.00	0.00	0.00	0.00	0.00	.34	0.00	.14
EUI	0.00	0.00	0.00	0.00	.34	0.00	.14	0.00
E Angio	0.00	0.00	0.00	0.00	0.00	.34	0.00	.14
BP	0.00	0.00	0.00	0.00	0.00	.34	0.00	.14
Angio.M	.80	0.00	0.00	0.00	0.00	0.00	.14	0.00
UI	0.00	1.60	.36	.72	1.35	2.36	.71	1.57

H, hay fever; A, asthma; M, migraine; U, urticaria; C, colitis; E, eczema; I, indigestion; Angio., angioneurotic edema; and B P, bladder pains.

Table 3

SYMPTOMS MENTIONED IN ORDER OF FREQUENCY BY DYSPEPTICS IN MINOR GROUP

Symptoms Mentioned	No Times
Indigestion	40
Nausea	33
Heartburn	32
Gas	14
Vomiting	10
Canker sores or mouth bumps	10
Sour stomach	8
Stomach ache	8
After taste	7
Water brash or regurgitation	5
Cramps	4
Palpitation	2
Fever blisters	2

Those persons suffering with indigestion described a variety of symptoms and each symptom was repeated two or more times. *Table 3* shows their order of frequency, designating 13 symptoms mentioned 175 times. Among the dyspeptics 47 different foods were pointed out. *Table 4* shows this number mentioned 192 times.

DISCUSSION

A close study of the frequency of symptoms alone and in combination in both groups bears interest. The table shows a much higher incidence of asthma and hay fever, for instance, than the figure about 2 per cent, generally agreed on as representing the occurrence of hay fever. The figures herein show that hay fever occurs in 3.57 per cent as a major allergic manifestation with no other allergy. Hay fever occurring as a major manifestation with and without other allergy reaches a figure around 8 per cent, and asthma about 5 per cent.

That the major allergic is subjected to insult by occasional factors, especially foods, is well brought out. Strawberry heads the list in both groups. Watermelon and cantaloupe are high up in both groups.

CONCLUSIONS

(1) Approximately 13 per cent of the popu-

Table 4

FOODS BLAMED, IN ORDER OF FREQUENCY BY DYSPEPTICS IN MINOR GROUP, AS GIVING RISE TO SYMPTOMS.

Food	Times Incriminated	Food	Times Incriminated
Cabbage	18	Cauliflower	3
Onion	17	Cream in coffee	2
Melon	15	Sweet potato	2
Banana	9	Oyster	2
Pork	9	Pickle	2
Beef	7	Mandarin	2
Fat	6	Salmon	2
Peanut	6	Coffee	2
Cucumber	6	Chocolate	2
Sweets	6	Pineapple	2
Tomato	5	Cane syrup	2
Egg	5	Peach	2
Radish	5	Okra	2
Sweet milk	5	Beet	1
Apple	5	Lamb	1
Butter bean	4	English pea	1
Sardine	4	Coconut	1
Cheese	4	Celery	1
Fish	4	Collards	1
Bell pepper	3	Apricots	1
Turnip	3	Black pepper	1
Corn	3	Marshmallow	1
Spinach	3	Cream	1
Strawberry	3		

lation at large are subject to major allergic manifestations.

(2) Of those remaining approximately 36 per cent describe minor, episodic allergic manifestations.

(3) The major allergic not infrequently is also affected with one or more minor manifestations. Although the major sufferer is bothered most by frequent foods or other factors, he also gets into trouble from occasionals.

201 West Franklin St.

DISCUSSION (*Abstract*)

Dr. Marion T. Davidson, Birmingham, Ala.—I have never conducted a survey such as this reported by Dr. Pipes, but I have some understanding of the difficulties involved. No busy physician can stop his practice long enough to do all the work, and as a consequence a great deal of it must be done by lay workers. The results must be evaluated in the light of this fact.

Nevertheless, Dr. Pipes' results are in surprising agreement with those of Dr. Vaughan, who conducted a similar survey. In Dr. Pipes' survey they found that 50 per cent of their group of 700 individuals had had some allergic manifestations at some time in their lives. Dr. Vaughan found 60 per cent.

These results bring to mind the question whether not merely 50 or 60 per cent are allergic, but is it not true that all of us are either actually or potentially allergic? In some of us the trigger mechanism may be not so acute as in others or in some the shock tissue of allergy may require greater stimulus to set it off. There are several ways of expressing the same thought.

It may also be true that some of the distinctions which have been thought to differentiate allergy in human beings from anaphylaxis in animals may not hold true. Perhaps we are not all capable of being sensitized to the same antigen as are guinea-pigs, but human beings may all be capable of being sensitized to some antigen under proper conditions.

I have always been skeptical of heat and cold sensitivity, but these speculations suggest another thought. May it not be that the epidemic colds which are common in inclement weather may be evidences of heat or cold sensitivity in the whole population?

Dr. Oscar Swineford, Jr., University, Va.—Dr. Pipes' paper is interesting and useful for a number of reasons. First of all, it shows what a wealth of useful allergic information can be gotten, even by the inexperienced, if one will but look for it. The information presented is referable to most of the body systems. Because of this the paper should help to make those who read it allergy conscious, a desirable aim.

The findings fully substantiate those of Vaughan in his survey of the population of a whole community. The minor statistical differences are not important.

A point which was not made clear was one which is commonly observed, namely, that major allergics are also apt to be victims of minor allergy. In other words, major and minor allergy are in no sense mutually exclusive.

Dr. Pipes (closing).—I feel that several outstanding points should be emphasized anew. First, the amnesic survey disclosed concepts not in accord with previous published beliefs. In previous publications it has been stated that from 8 to 10 per cent of the population at large are allergic, that is, suffer with major allergy. My figures show, even at a conservative maximum, that 14 per cent are afflicted with major allergy. Previous estimates show that about 2 per cent are affected with hay fever. My figures, even at a conservative estimate, show that at least 8 per cent are affected with hay fever. It may be that we actually have more allergy per unit population in the "deep South" explained on the basis of prolonged pollinating seasons and thus more chronic exposure of the respiratory tissue to allergens.

I do not wish to take advantage of the absence of Dr. Rowe in my next point. However, my study of food allergens as prompted by the response to the questionnaires upon which this paper is based discloses the fact that the major allergic reacts with astonishing frequency to incidental factors. This does not speak well for Dr. Rowe's "elimination diet" program.

Another point of interest which merits emphasis is that the major allergic is frequently beset with manifestations of minor allergy in addition to his major complaint or complaints.

LOCAL RESPONSIBILITIES IN COMMUNICABLE DISEASE CONTROL*

By J. A. MILNE, M.D., M.P.H.
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A program of communicable disease control in a public health program has two major objectives: first, informing the public regarding those diseases over which effective control measures are known, and second, building up community participation and support for control measures affecting these diseases through an understanding and endorsement of the program. The administrative responsibility for such a program must necessarily be in the state department of health, which is charged by law, in most instances, to make such rules and regulations as are necessary to protect the health of the people. The state department of health discharges its duties through local health departments whose personnel is well informed as to the problem and the program for its solution.

If the most effective control measures are to be carried out, certain groups in the area must be considered and their support secured. No one group in the community should be singled out as having the whole responsibility for cer-

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tain phases of the work; the entire program must be a cooperative undertaking. In the average community a canvas should be made to locate influential and interested organizations and individuals. The attention of the health department might well be directed toward securing the aid and support of the following:

(1) Private physicians and allied medical groups.
(2) Private health agencies.
(3) Hospitals, clinics, dispensaries and so on.
(4) Schools and educational groups.
(5) Law enforcement officers.
(6) Civic and lay groups.
(7) Daily and weekly press.
(8) Potential leaders.

In reviewing the list of individuals who should be actively concerned in the program, it may be noted that few of the activities promoted in the field of communicable diseases are directed to or affected by one group only. For instance, if a case of scarlet fever occurs in a school child, the attending physician will make the necessary report to the health officer who is responsible for the institution of proper isolation and quarantine of contacts. The quarantining of contacts may affect several homes in the community. The school authorities, in turn, will be notified of the case and contacts and will be held responsible for keeping these children from school until further notified by the health department.

The control of communicable diseases ought to begin in the home. The home and the community are jointly responsible for sending the child to school free of diseases transmissible to others. The failure in many of our diphtheria programs has been due to laxity on the part of influential citizens of a community in promoting the necessary education of parents in having their children protected against this disease. Health councils are valuable for mobilizing the health resources of a community, for supplying strategic links in the promotion of a control program, and for drawing into lines persons whose support may mean the difference in success or failure.

During the school session it is not unusual to hear a mother state that she is going to continue sending her child, sick with whooping-cough or some other communicable disease, to school until the school authorities discover the condition and ask that the child be kept at home. Her argument is that the child got the disease in school from someone else; consequently, she does not see why her child should be isolated while other children with similar conditions are not. In such instances, it is only when parents are sufficiently educated to take upon themselves the proper responsibilities and exercise the principles of the Golden Rule that we shall attain a reasonable goal in the control of communicable disease in schools. When we consider the number involved in the control of a case of communicable disease, we realize that our associated environment, except within certain limitations, often trespasses upon the rights of many others. Each child is a potential link in the chain of communicable disease transmission. Every effort should be directed toward prevention and, in the event of disease, the utmost discretion should be exercised in carrying out the necessary control measures in school.

Education, both lay and professional, plays a vitally important part in the control of disease. The public has to be reliably informed as to early signs and symptoms of disease and also in the dangers and sequelae that may follow. Relatively few parents realize how high the mortality rate from measles in children is, or how great the danger from pneumonia as a complication. When a child has measles, too many parents are inclined to say, "he has *only* measles," and little, if any, medical care is sought. A number of other diseases are as lightly dismissed.

Though the education of the masses is not a function of the health department solely, this department is responsible for the sponsoring of an official program of health education. The private physician, the teacher, the civic group, the federated women's club, and all other service groups should take an active part in promoting a program designed to inform the public of their responsibility in disease prevention and health promotion. The scientific knowledge of the health officer and private physician in the community should be drawn upon for recent information and new developments concerning scientific methods of prevention and treatment.

The health education of the child is definitely a function of the classroom teacher. She is in contact with him throughout the day. She knows, or should know, the health needs of the child and how these needs may best be met. Successful health teaching should be correlated or integrated with various other subjects. The

responsibility for reliably informing the teacher concerning child health needs is partly that of the local health officer and the nurse. The teacher is often not able to discriminate between truths, half truths, or actual falsehoods, as they appear in health literature; she is often unsure as to what activities are most productive of improved attitudes and habits on the part of children.

In reviewing health activities it is often observed that health officials do not take seriously enough those observations which the teachers think are significant, while, on the other hand, teachers in many instances feel that their observations have no significance to the nurse or physician. It is only through the definite cooperation of the departments of health and education that the greatest service can be rendered the child.

It is important that health officials, physicians, and other health educators employ only facts which are sound in content and in keeping with the established facts of medicine and public health. Half truths, however popular, should not appear in health bulletins and none but modest claims should be made for new methods of prevention or treatment of disease. Rather, let the application of a new truth lag behind the record of successful experiment than have to excuse the fallacy or wrong emphasis of premature publicity about some uncorroborated claim of discovery.

The intelligent health officer should realize the importance of enlisting the physicians in his community in the practice of preventive medicine. The local family physician usually is intensely interested in the lives of his patients and their families in matters affecting both health and disease. A reasonable concern on his part and the exertion of sufficient influence would result in a greater utilization of preventive services by the laity. The family physician is urgently needed and should have the assured confidence and backing of those who understand the work and wish to see it progress. It is impossible to tell how many patients are actually turned away from the door of the family physician by the doctor himself. He has done so little to justify the confidence of his patients along the lines of preventive medicine; he has failed in assuring people that he could give them the very service that they go to the health department to obtain. It is quite evident in many cases that the reason for this is laxity on the physician's part rather than failure on the part of the health department and its associates to stimulate an interest in the work.

The relationship of the health officer to the physician should be one of friendliness, mutual helpfulness, and genuine wholehearted cooperation in everything which pertains to the health and prolongation of the lives of the citizens. It is only in this way that each of them can best succeed in the performance of the duty that devolves upon him. The success which any health officer attains in the performance of his duty will be very largely dependent upon the support and cooperation which he receives from the physicians in the community over which he has jurisdiction. This is an axiom which all health officers must recognize and observe.

In the field of communicable disease the interest of the public is more or less directed by occurrences which are dramatic rather than by the significance of the impending dangers. A great deal of public sentiment can be stirred up over a few cases of psittacosis when in the same area hundreds are dying from tuberculosis or diphtheria. It cannot be expected that American health workers will be able to stimulate as much interest today in typhoid fever as they did a few decades ago when the disease was ten times, or in some instances twenty times, as prevalent as it is now. In the face of such condition, interest in typhoid fever has naturally waned. At the same time, we need to remind ourselves that the relative exemption from typhoid fever in certain areas today is purchased only through eternal vigilance of public officials and health workers.

It was one of the earliest practical triumphs of epidemiology to show that typhoid fever and certain other filth-borne diseases were often due to contaminated drinking water and could be largely prevented by improving the character of the supply. The chlorination or filtration of water, or a combination of both processes, has proven an effective and relatively inexpensive means of providing a safe water supply today. The local responsibility of a safe water supply is likely to increase rather than diminish with the ever-growing load of pollution of streams and lakes. The responsibility for the installation of such processes rests upon the shoulders of the community officials, action being prompted through the demands of the interested public.

In the field of typhoid fever control, and the control of other filth-borne diseases, special mention must be made of the important part played by individual home sanitation and the protection

of individual water supplies. The responsibility for these sanitary improvements is of an individual nature, each property owner being responsible for his own installations. Wells should be located with great care and should be so constructed as to furnish safe water to the user, privies and septic tanks located and constructed where they are not a hazard to health. The responsibility of providing technical advice and information as well as adequate supervisory service ought to come through the local health department.

One of the most generally advocated and temporarily effective means of typhoid fever control, especially in the Southern States, has been the administering of typhoid vaccine to large groups. The effectiveness has been due to the intense interest and promotional work af the health departments, private physicians, civic groups, and others. Today, with the great reduction in typhoid fever, the search for typhoid carriers must be emphasized as an additional measure to decrease the cases of this disease. The bacterial examination necessary in the search for typhoid carriers and the presence of other diseases among food handlers in dairies, restaurants, hotels and boarding houses, is an enormous task. The proprietors in these establishments should be responsible for the health of the workers.

With the uncovering of typhoid fever carriers, and carriers of other diseases, reasonable regulations must be instituted. Practically all states at the present time have adopted policies regarding occupations and privileges that must be denied these individuals. The enforcing of these regulations, and all other regulations governing the control of communicable diseases, is the duty of the health department or the law-enforcing bodies. Education will prove more productive of results than enforcement by methods of law.

The value of pasteurized milk in the prevention of disease is too well recognized to need special exposition. In too many cities and towns today and in practically all rural areas means are not available for people thus to protect their milk supply. In all towns and cities not having pasteurized milk, a demand should be created for this product through popular appeal. All milk sold for consumption should be graded according to methods of production, equipment, and bacteria count. Special encouragement should be given toward the use of higher grades. Lowering of milk standards in order to provide cheap milk should not be tolerated. The responsibility of this supervisory program falls upon the health department or special officers appointed for the purpose. Pediatricians and other physicians generally are cognizant of the danger of inferior grade milk but are not so enthusiastic as one should desire in imparting the knowledge to the public generally. An educational program based on the disease hazards of milk should be persistently carried out.

Health authorities thus far have had little voice in the promulgating of milk marketing agreements. Those concerned only with the economic aspect of milk control neglect the public health aspect. The milk supply of many of our large cities is not yet of a uniform, satisfactory, sanitary quality. There are still many tuberculous cattle in dairy herds. The elimination of contagious abortion from herds has scarcely begun. These are the problems in milk sanitation and efforts must be made toward their solution through necessary education and ordinance enforcement.

Raw foods other than milk may often be vehicles of infection. In most instances today food processing plants come under the pure food laws and Federal or state supervision where definite regulations must be met regarding methods of handling and equipment for proper storage. Meats, in many states, come to the consumer today with the stamp of approval from Federal or local authorities. Pure foods, safe from disease, are available to the public generally, yet ungraded, bootlegged, and contaminated foods are, in many instances, sold to the unsuspecting public at prices commensurate with the better products. The remedying of this condition falls upon the public generally.

The transmission of disease by food and drink dispensers is a real hazard in the spread of disease. This means of spread will continue until the public demands clean food and drink, served on clean dishes, by healthy attendants with clean hands; or, until health departments generally take vigorous action in enforcing already-existing sanitary codes. Public apathy is to blame that sanitary laws now on the books are not more generally enforced. Not many years ago the public accepted the public drinking cup. When health departments convinced the public of this danger in spreading disease from one individual to another, action was demanded for its abolishment. Following this principle, further action is still desired at the present time in

demanding thorough cleaning of glasses, dishes and tableware between servings.

In many places today, barber shops and hair dressing parlors either do not operate under sanitary regulations or the regulations are not enforced, demanding the use of sterilized instruments and individual towels. Much improvement can yet be made in the sanitation of swimming pools and camp ground sites. The abolishment of insanitary conditions only proceeds as far as the public dictates in having local ordinances promulgated and enforced.

The newspapers are potent factors in a disease control program. The solution of good newspaper publicity is in taking the newspaper reporter into your confidence and letting him share in the background of the reasons for such statements as may be made. A well-informed reporter can do much to further the interest of any program. On the other hand, a reporter who is not brought into the inner circle may misconstrue many items so that the publicity is useless. In getting certain information before the public, it is most imperative that the aid of the press be secured. The health department may use the press to inform the public when the onset of a measles epidemic may occur; it may be used to note the daily progress in the control of an epidemic, the arrangement of schedules for inoculation service, and information of a similar type. News items of local interest should be correlated with items of an educational nature. The responsibility for the wise employment of the press usually falls upon the health department.

In the furtherance of a program in disease prevention reasonably adequate appropriations must be secured for carrying on the work. The responsibility for securing such appropriations falls upon the heads of those agencies promoting the programs. Funds can be obtained only by convincing the appropriating bodies that such a program is practical and directed toward the public welfare of the community. Too often we are negligent and we procrastinate in this duty until the time when appropriations are pending. The appropriating bodies then feel that much of the explanation is directed toward the obtaining of funds rather than the informing of achievements.

Health education, to be effective either in securing appropriations or informing the public generally, must be consistent and integrated in the entire program throughout the year.

It has long been recognized that the public gets about what it wants and, whether we like it or not, the people will make their own choice. It is a responsibility of those interested in public health to offer the necessary guidance.

DISCUSSION (*Abstract*)

Dr. James A. Crabtree, Knoxville, Tenn.—The great bulk of epidemiological investigation to date has consisted of more or less isolated observations, limited to a particular time interval when an epidemic occurred, and concerned with selected groups of individuals representing only a limited number of conditions responsible for the occurrence of the disease during a particular period of time.

However, as our health organization becomes extended and expanded and as community efforts for health conservation become more elaborate with increasing barriers set up against wholesale and rapid dissemination of etiologic agents, these explosive manifestations of disease are becoming less frequent, and epidemiological interests are turning to the study of intercurrent conditions and the reasons for the maintenance of disease between epidemic periods.

Similarly in the control of disease, emphasis is shifting from the more obvious, gross and easily remediable conditions, to those which are less obvious and more difficult of remedy. At present the real preponderance of effort in the control of communicable diseases is directed against their endemic manifestations.

Effective control of a communicable disease usually requires a reasonable understanding of its epidemiology which, in its broadest sense, is concerned with causes and conditions of health as well as disease. Therefore, in the approach to communicable disease control, it is important that our point of view be both positive and negative.

If it is agreed that these requirements are necessary for the execution of specific control measures, there would seem to be little question as to which of the three elements in our public health organization has the largest opportunity for meeting them.

State and Federal agencies occupy positions of importance and can render service not possible to the local agency, but neither is near the field of observation, and neither can, except at prohibitive expense, duplicate the facilities of the local health department.

The Federal service may correlate local and state programs and studies into a national comprehension of the problem and can undertake studies and research on a national or regional scale which neither the state nor local agency is equipped to do.

Similarly, the state can correlate local studies and programs into a state comprehension of the problem and can develop these studies into state-wide application. It can, of course, plan and direct the program as a whole, and if directed wisely, can prevent excessive duplication of efforts at study and promote the com-

mon usage of those control procedures which permit of standardization.

However, in the field of epidemiological inquiry, as in the field of any scientific discipline, there is need for duplication of effort; moreover, in any program which is as empirical as our present program of communicable disease control, standardization can readily reach the point of devitalizing it and seriously retarding its progress. Therefore it would seem that the need for duplication of efforts in study and the danger of too rapid standardization of procedures in control commend themselves to the support of decentralization of service in communicable disease control.

The local unit is the agency strategically situated to make observations, collect information and aid in the interpretation of data in relation to local conditions. In other words, it is the vital link in the chain of organized facilities for the general administration of public health work, of which communicable disease control is everywhere recognized as a basic function.

Decentralization of service in communicable disease control recognizes the individualization of problems in their relation to individual community conditions; prevents the routinizing and sterilizing influence of undue standardization of procedure; and finally promotes a critical point of view and a spirit of healthy discontent on the part of local personnel which, when under sound guidance, is synonymous with progress.

One has only to refer to the work of Chapin to be reminded of the potentialities which are tied up within the opportunities of local health agencies.

While under our present organization of health service much can be accomplished, certain basic improvements must be effected before optimum achievements can be reached. Local health work must be put upon a professional and career-service basis; and the personnel of such departments must include people trained in epidemiological methods; states must recognize their responsibility and meet it by strengthening their departments of epidemiology, which will in turn provide leadership for local health officers; the Federal government should provide a corps of trained people to assist states in organizing, developing and strengthening such departments; and finally, we must come to realize more fully that the place for our best epidemiologists is in the field and with our local organizations where opportunities for real advancement of our knowledge of communicable diseases are most fruitful.

Dr. Myron G. Tull, Baltimore, Md.—I wish to emphasize just three points that Dr. Milne brought out as being particularly in close relationship to the work of the Sydenham Hospital. First, the education of parents in the prevention of disease is particularly important. This point has been brought out repeatedly in the four annual campaigns that the Baltimore City Health Department has held for diphtheria prevention, the department maintaining that ignorance on the part of parents is the biggest drawback to a highly successful diphtheria prevention campaign. The second point I wish to emphasize is the necessity for cooperation of health authorities with family physicians. This is the aim of our Commissioner of Health of Baltimore, and I think he has developed a very friendly feeling between the department and the practicing physicians; and lastly, a close cooperation between the newspapers and the health department can go a long way towards making any prevention campaign a huge success.

When it comes to the control of communicable diseases in a communicable disease hospital, the problem resolves itself into two major issues: first, protection of the patients, and second, protection of personnel. Thus, from the standpoint of the patient one must consider sex, age, color, disease and complications in allotting bed space. Obviously, it is unfair to those in the hospital, as well as to incoming patients, to put any one where he does not belong, exposing the first to a disease he does not have and the second to a disease to which he may be susceptible. In protecting the personnel we try to inculcate by precept and example certain rudimentary elements in communicable disease control such as the protection of clothing by gowns when in contact with a patient. We also emphasize the desirability of keeping hands clean, keeping hands away from the face, face away from the patient's face and not eating anything in the patient's room. We desire also to have employes report any illness in themselves prior to going on duty. Recently, we have tested all hospital personnel, especially nurses, by the Dick method for suceptibility to scarlet fever, and where the test is found positive have advised immunization.

After the admission of a patient the prevention of cross infection depends upon the technic and how rigidly the personnel adheres to it. Any technic, whether it be patient technic (each patient a unit), or disease technic (several patients of the same disease together), and both are used at Sydenham Hospital, is only as strong as its weakest link. That link is the human equation. Unless everyone conscientiously carries out every detail, the most elaborate technic will break down. Conversely, if every one, nurses, doctors, maids and orderlies satisfactorily adheres to the simplest technic in all its details, that technic will work satisfactorily.

We believe we have reduced our technic to the simplest procedure. Nowhere will one find scummy pans of bichloride solution nor smelly pans of cresol in which to dip hands. We have discarded masks and the mop caps, permitting our nurses to wear their school caps providing a net holds the loose tendrils of hair out of the girls' faces. We rely on gowns to protect the clothing of physicians, nurses, and so forth when in contact with a patient and a double scrubbing of hands in green soap and running water on leaving the patient, once in the patient's room and once in a neutral room outside the patient's room.

The rest of the technic consists in steam sterilization of dishes, utensils, and so forth. After a patient's use, even our linen is subject to steam sterilization during the rinse process in the laundry, and all trash, refuse, and so forth collected in paper bags from every room is burned. The furniture, which is metal, and the walls of the room are washed with soap and water before we admit to that room a patient with a disease different from the one that left it.

We feel that the success of our plan is measured by the results we have obtained. The incidence of communicable diseases among the personnel is at a relatively low level. If we leave out of account infections brought into the wards during the incubation period, cross infection among the patients has become nil. We experienced during the past three years one case of scarlet fever developing in a patient in the hospital for another illness and this case we attributed to the

fact that the nurse in attendance took care of the child for a day or two before she reported a streptococcus infection in her own throat.

(1) We recommend that the technic employed be reduced to as simple a form as possible.

(2) Personnel wear gowns when attending patients and twice wash hands when through.

(3) Proper sterilization of dishes, linen, and so forth.

(4) Thorough physical examination of every patient before placing him in a ward.

(5) Small wards of not more than six beds.

IMPLANTATION IN OZENA*

By JOSEPH ISAAC KEMLER, M.D.
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Ozena is essentially a chronic condition characterized by atrophy and sclerosis of the nasal mucous membrane and the underlying bone, which thus produces an abnormal patency of the nasal passages. It is associated with a fetid mucopurulent discharge which dries into the crusts that may completely obstruct the nares and are difficult to remove. Ozena should be differentiated from atrophic rhinitis which has not a characteristic odor and which, according to Ruskin,[1] is due to a different pathological condition, namely, a chronic inflammatory process characterized by a loss of the columnar cells and their cilia. There is also a marked lymphatic invasion of the tissues chiefly in the turbinal regions, with little or no fibrosis or vascular change. Ozena, on the other hand, shows degeneration of the epithelium with lymphocytic infiltration underlying which are dense areas of fibrous tissue. The secretory cells degenerate early and the arterioles are definitely thickened and fibrosed, the picture here being one of tissue fibrosis due to loss of a normal blood supply which ultimately leads to resorption of bone.

Atrophic rhinitis can very frequently be traced to a preceding chronic sinusitis, lues, a foreign body, trauma, tuberculosis, and various other conditions. The etiology of ozena is still an open question. In a paper[2] on ozena written in 1929 this was my personal conclusion; and although various theories have been advanced since that time, we have obtained no better proof than before. Mortimer[3] believes ozena to be due to hypopituitarism; Pollack[4] stresses heredity. Nor is the cause of the fetor definitely known. Frise[5] states that it is produced by bacteria which are associated with protein putrefaction.

Happily, ozena is definitely on the decrease in this country, a fact which is borne out by men with large private practices as well as by others associated with large free clinics. Many of the patients have lived among unhygienic surroundings, with a lack of proper diets. The betterment of the standards of living, which has also brought with it proper dietary balance, would seem to be a factor in the decrease of ozena. Pollack claims, however, that this decrease is due to the restricted immigration from Southern and Southeastern Europe where ozena is most prevalent, and certainly individuals pay more attention to nasal ailments than formerly.

However, regardless of the cause of atrophic rhinitis when associated with ozena, the patient comes to us for relief of the obnoxious fetor, a distressing symptom, which calls earnestly for alleviation.

The history of the patient should be gone into very carefully, particularly as regards to his hygienic habits, exercise, rest, bathing, bowel movements, and so on. These should be regulated. As far as possible dust should be avoided and tobacco should be used very sparingly, if at all. Constitutional treatment, where indicated, should be instituted.

What are the symptoms? First and foremost is the odor, occasionally headaches and sometimes a stopped-up nose. All these are due to the accumulation of crusts. How does this accumulation occur? Simply because the nasal chambers are too wide, a pathological state which predominates in all ozena cases. A greater quantity of air passing through the nose during respiration increases the viscosity of the nasal secretions owing to accelerated evaporation of its fluid content, and this drying effect promotes the formation of crusts. These crusts injure the sensitive ciliary apparatus so that they fail to prevent the stagnation of secretion that leads to the accumulation of these crusts. As a matter of fact, the intake of air is greater in quantity, but the force of the current is lessened because of the greater width of the nasal chambers, and as a result the crusts, instead of being blown out, remain and stop up the nose. Newman[6] and Proetz[7] demonstrated that, if the nasal passages are narrow and nasal respiration is maintained, the pressure during expiration is greater than during inspiration, but that the reverse will follow in cases of unusually wide nasal chambers. Wachsberger[8] says:

"From cases of unilateral ozena and a marked septal

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deviation toward the side in which no crusts are present, it is permissible to conclude that the narrowness of that side is responsible for the fact that ozena does not develop. This assumption finds support in my observation of several patients on whom a submucous resection had previously been performed and who stated that the formation of crusts had increased on the formerly obstructed side after the submucous operation. Genuine ozena is always bilateral in equally wide nasal fossae; and the wider the nose, the more severe are the symptoms."

Treatment.—Careful removal of the crusts, followed by washes, sprays, and the application of stimulating drugs will give temporary relief. Various vaccines have had a good effect for variable lengths of time. Unfortunately, discontinuance of the vaccine therapy has been followed by a return of all of the unpleasant symptoms produced by the ozenic state.

A more lasting or a permanent cure can be obtained by narrowing the nasal chambers. As early as 1894, Saenger[9] used metal plates in the nose to accomplish this. In 1900, Gersuny[10] introduced paraffin into the mucous membranes and from that time on paraffin has been used widely for many years, and by some even to the present time. Different authors used paraffin of varied melting points and consistencies. The paraffin was injected or implanted in different situations in the nose. Thus, Hutter[11] laid great stress upon the use of paraffin in the floor of the nose, implanted through the mouth. This method I myself employed for a number of years, and also implanted paraffin into the septum according to the Wileminsky technic. In a majority of my patients who were followed for a long time, excellent results were obtained. The implants remained accurately in place. Occasionally patients come back whose noses cannot be recognized as ever having had ozena, and only the history reveals the fact that I have operated fifteen or more years ago.

That paraffin is a dangerous material was proven quite early, inasmuch as it may wander off to places where its presence is highly undesirable. In order to obviate this danger, the paraffin was implanted instead of being injected; the hard kind being used instead of the soft. In my own cases I have never encountered any untoward symptoms. However, paraffinomas began to be reported later on and the use of this material practically has been discontinued, various other substances being substituted. Eckert Moebius[13] used spongy beef bone; Muskat[14] experimented with bits of fascia lata. Others employed implants of celluloid, gutta percha, and fat. Unfortunately all these materials were either absorbed or extruded. King[15] and Pollack[16] began to use ivory introduced into the septum, a device which they later perfected so successfully that it has remained permanently in position.

In my own experience, a piece of ivory when properly introduced into the floor of the nose, according to the method described in a former paper,[17] if not too large, will remain in place. Some of my patients who were operated upon ten or more years ago and in whose noses the ivory had been accurately in place had been rendered practically symptomless.

Before starting to work with ivory, I used autogenous bone obtained from the patient's rib with excellent results. This was suggested by Steurer[18] in 1922, and by Pollack[19] in 1923. I now use both, preferring ivory in smaller nares where the introduction of a small piece into the floor will bring about good results, while bone taken from the rib is introduced into the floor and septum whenever larger cavities are to be filled.[17]

Hencke[20] claims that the foreign material is extruded because a secondary infection follows its introduction through the nose since the mucous membrane always contains pathogenic organisms left there by the pre-existing ozena. He therefore resorts to an operation of his own in which he makes his incision through the mouth, just as in a radical antrum operation, and exposes the lateral walls of the apertura pyriformis. He then dissects the mucous membrane and periosteum away from the lateral wall, chisels the attachment of the inferior turbinate and moves the mucous membrane and the turbinate towards the septum. In the pocket thus created, he implants small pieces of ivory. Frohn Curt,[21] in unilateral ozena, performs a submucous resection through the convex or healthy side and then implants the ivory between the two membranes. He performed this operation in 16 cases with good results in every one of them.

That my ivory implant remained permanently in the floor of the nose is due to the fact that I operated through the mouth, whereas the ivory that I had implanted into the septum through the nasal mucous membrane of the same side had all been extruded.

So far the only other way of narrowing the nasal chamber consists in moving the lateral wall

and inferior turbinate to the septum. This method was introduced by Lautenschlager[22] in 1916 and modified by Wittmack,[23] Hinsberg,[24] and Halle,[25] and lately by Wachsberger.[8] In his operation he cuts through the skin of the nose without making any incision into the nasal mucosa, thus preventing any permanent opening into the antrum. As the last named operation appears to be the simplest and the best, a brief outline of it for comparison with implants may not be out of place here.

The medial side of both turbinates and the parts of the septum opposite are scarified with a knife. An incision along and on the facial side of the pyriform crest, extending from the insertion of the inferior turbinate down to the nasal floor, is made and carried through the skin and the periosteum. This is followed by elevation of the periosteum at the height of the pyriform crest by scraping it with the chisel, so as to expose anterior and the medial bony walls of the antrum. The pyriform crest is then severed on the facial side with a chisel from the level of the insertion of the inferior turbinate as far as possible down to the nasal floor, cutting all along the floor and forcibly moving the lateral wall to the septum. Firm packing of the antrum with vaseline tampons concludes the operation. The after-treatment requires little time and effort.

But while the after-treatment is simple, the operation is still rather formidable. It is attended by marked reaction with much discomfort to the patient, and is not free from complications.

In every one of these operations the antrum is opened. Lautenschlager[26] proved that since the pathological secretion in ozena is produced by the mucosa of the nasal chambers itself, there is always danger of infecting the normal mucous membrane of the antrum. All these operations necessitate prolonged hospitalization. Dacrocystitis is very apt to result after any one of them. The end results are frequently disappointing because the wall recedes to its original position. Moreover, in those cases in which the lateral wall does not recede the adhesions formed prevent the expulsion of the crusts and the patient is no better off than he was before. Wachsberger states that implantations are very simple to carry out, but that a fistula may form through which the implanted material, acting like a foreign body, may be discharged. Hubert and Robinson[27] have used radium in ozena cases with very good results, but Percy Wright,[28] who has followed up their work with radium, supplemented his treatment by implanting cartilage from a rib into the mucoperiosteum of the septal wall, thus narrowing the nasal chamber.

COMMENT

Working on ozena for the last 25 years, with a limited number of patients, has afforded me enough material from which definite conclusions are justifiable. My best results have been obtained with paraffin implantation. I have never injected it, and have always used the hard variety. The reason for the good results lies in the unlimited amounts of paraffin that could be employed and the ease with which all spaces could be filled in. The results obtained with autogenous bone and cartilage or with ivory implantation depend upon the amount implanted and the space obliterated. The more thorough the obliteration of the excess space, the better the results. In all my operations, the floor of the nose, where the current of air is more sluggish and which thus allows the greatest accumulation of crusts, is raised so that the entire nasal chamber is in direct current of air during respiration. The consequent narrowing of the nasal chambers makes it easy for the patient to expel the secretion, so there is no accumulation and therefore no fetor. Occasionally a patient will have to douche his nose, because the regeneration of the cilia is not to be expected and the mucosa cannot be made so clean as that of a normal nose. Warm solution daily will prove effective. On the other hand, the air in the nasal chambers, coming in contact with the mucosa, is warmed and moistened by the excellent blood supply to the mucosa, as evidenced by the color, making it better prepared for its entrance into the pharynx, larynx, trachea and lungs. The dry pharynx with the crusts upon it extending further into the larynx and trachea will disappear. The patient is quite comfortable and a cure is established.

CONCLUSIONS

Narrowing of the nasal chambers is the only hope for a cure in ozena. The implantation of material into the mucoperichondrium and periosteum affords the simplest and easiest way to accomplish this. Any material that is found to be non-absorbent, and that will remain *in situ*,

is the material of choice. Ivory in the floor of the nose and in the septum, when correctly applied, in my experience, will stay there permanently. The mucous membrane becomes thickened by the formation of a capsule around the foreign body. Bone and cartilage will stay in the septum and likewise produce the desired effect. This should be effected first without disturbing the rest of the anatomy of the nose and of the surrounding tissue. Failing in this method, we can then bring the lateral wall to the septum as described above. If the implantation has been made correctly, our ivory will remain permanently in position and thereby bring about a cure.

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UNUSUAL REACTION FROM TYPHOID VACCINE GIVEN INTRAVENOUSLY IN A CASE OF PSORIASIS*

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Hench,[1] in an excellent paper, reviewed the usual and unusual reactions to intravenous typhoid vaccine at the Mayo Clinic. He stated that in 2,500 cases, comprising about 10,000 injections, untoward results were noted in only 20 injections and in only 14 patients, an incidence of about 0.5 per cent of the patients. Death occurred in 3 cases.

Unusual reactions following injection of the vaccine intravenously were acute and subacute appendicitis, cholecystitis, enteritis, pleurisy, pericarditis, iritis, glaucoma, adenitis, extensive vascular thrombosis, and renal insufficiency.

Cecil,[2] in a recent article, states that among the complications attributed to foreign protein reactions have been delirium tremens, cardiac failure, vascular thrombosis, acute nephritis, herpes labialis, rheumatic purpura, acute diarrhea and activation of old pulmonary tuberculosis.

Hench reports that unusual reactions have been noted much more frequently on the arthritic and vascular services of the Mayo Clinic. He states that in the section on dermatology and syphilology much larger doses are given than on the arthritic service, yet untoward reactions are rare. Engman and McGarry[3] report marked temporary nephritis and exacerbation of cutaneous conditions in the dermatologic cases.

Unusual reactions, according to Hench, are due mainly to: (1) stimulation of inflammatory foci of infectious origin; (2) stimulation of inflammatory foci of non-infectious origin (ocular and renal lesions, pain at site of a recent fracture); (3) stimulation of latent diathetic phenomena (asthma, gout, and so on); (4) reactions dependent on some marked vasomotor or intravascular chemical change; or a profound disturbance in capillary permeability or colloidal dispersion (vascular accidents, especially the acute ones).

This case is presented, not to discuss the treatment of psoriasis by non-specific protein therapy, but to report an unusual and untoward

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reaction to a foreign protein injected intravenously ("triple typhoid vaccine"), in a patient previously immunized by triple typhoid vaccine subcutaneously.

Although Gay and Chickering,[4] Kibler and McBride,[5] McWilliams[6] and others have reported untoward reactions after typhoid vaccine had been given intravenously in cases of typhoid fever, a review of the literature does not reveal an instance of an untoward reaction from intravenous typhoid vaccine in a patient who had previously been immunized by typhoid vaccine subcutaneously.

CASE REPORT

F. C., a white woman, aged 21 years, walked into the medical ward on October 27, 1930, having been referred from the out-patient department. She had suffered for the preceding 17 years from psoriasis which, aside from the usual remissions, responded but little to treatment. In the out-patient clinic she had been given 0.5 c. c. of the "triple typhoid" vaccine (*Bacillus typhosus, paratyphosus A and B*), subcutaneously, followed by 1 c. c. at seven-day intervals for two doses. She was sent into the hospital to be given the vaccine intravenously in hopes of improving her psoriasis.

On admission the physical examination, aside from her psoriasis and an old lower midline abdominal scar, was essentially negative. The urinalysis was negative. Her blood pressure was 120/80.

Her past history included measles and whooping cough in childhood. In 1926, she had a right oophorectomy and bilateral salpingectomy. In September, 1927, she had estivo-autumnal malaria. Her family history was irrelevant aside from her father's having asthma.

On October 27, at 4:00 p. m., she was given ½ minim (30 million bacilli) of "triple typhoid" vaccine intravenously. The usual chill followed in about an hour and at 8:00 p. m. the temperature was 105.4°. At midnight the temperature was 102.6°, and for the next twenty-four hours the reaction was not extraordinary. On the morning of October 29 (36 hours after injection), however, a marked change had occurred. The patient was stuporous and when aroused complained of great general malaise and pain in all her joints. The skin showed generalized edema and there was a diffuse scarletinaform erythema, most marked over the face and limbs. The joints of the arms, legs, hands and feet were swollen, red and exquisitely painful on movement. There was slight icterus of the skin.

The eyes showed intense injection and marked icterus of the sclerae, orbital and palpebral.

The lips were greatly swollen, and very red. The tongue was intensely red with general desquamation and ulceration of the tip. The pharynx was not injected.

The lungs showed no abnormal physical signs. The heart, aside from enfeeblement of the sounds, was essentially negative. Blood pressure was 90/50.

The abdomen was full, rounded and moderately distended with gas. The liver edge was palpable three fingrebreadths below the right costal margin and was exquisitely tender. The spleen was not palpable. There was marked tenderness in both kidney regions.

The urine at this time showed a plus 3 albumin, many white blood cells, few in clumps; many red blood cells and a few hyaline casts. The phenolsulphonephthalein output in two hours after intravenous injection was only a trace; 375 c. c. of urine were excreted. *Tables 1* and *2* give results of urinalyses and blood chemical examinations.

Table 1

URINALYSES

October 29, a catheterized specimen showed 2 plus albumin, sugar, acetone and diacetic acid negative, many white blood cells and a few hyaline casts.

Voided specimens subsequently examined showed:

October 30, albumin 2 plus, many white cells, red blood cells and no casts.

November 4, a trace of albumin and a few white cells.

November 6, no albumin, but a few white cells.

November 10, scattered white blood cells.

Table 2

BLOOD CHEMICAL TESTS

	Sugar Mg. Per 100 c. c. Blood	N.P.N. Mg. Per 100 c. c. Blood	Icterus Index	Bilirubin (van den Bergh, Indirect) Mg. Per Cent	Creatinine Mg. Per 100 c. c. Blood
Oct. 29	91	66.6	20	3.26	4.7
Oct. 30	111	63.1	15	2.27	3.75
Oct. 31	101	66.6	25	2.67	3.75
Nov. 1	125	50.0	25	2.02	5.00
Nov. 2	102	40.0	20	2.50	2.72
Nov. 3	111	27.8	11	1.87	2.00
Nov. 4	133	21.4	12	1.50	2.09
Nov. 5	118	27.8	11	1.75	2.00

The impression at this time was: acute hepatitis and nephritis as part of a probable allergic reaction to the typhoid protein, with arthritis, erythema and stomatitis as added complications. The blood Wassermann reaction was negative.

In view of the patient's alarming condition a continuous venoclysis of 10 per cent glucose was started. A constant flow at the rate of 30 to 40 drops a minute was maintained. In addition, glucose orangeades and lemonades were forced.

At 6:40 p. m. her blood pressure was 84/0. She became cyanotic, the pulse was weak and there was gallop rhythm of the heart. The patient's condition at this time was deemed critical. At 7:20 p. m. the blood pressure was 84/0 and at 10:30 p. m. 84/20. At this time about 650 c. c. of the glucose solution had run in. October 30, at 12:30 a. m., the blood pressure was 78/36 and the general condition of the patient was somewhat improved. At 1:30 a. m. the blood pressure was 80/40 and at 7:45 a. m. (24 hours later) 86/50; her heart sounds were stronger. At 12:30 p. m. the blood pressure had risen to 90/50 and at 6:30 p. m. it was 98/56.

There was a rapid improvement beginning about 12 hours after the initiation of the venoclysis. By October

31, the jaundice was diminished, the liver edge just palpable and only slightly tender. On November 1, marked herpes labialis appeared. On this date the liver tenderness was completely absent, but in view of the renal irritation it was deemed advisable to continue the venoclysis a few more days.

On November 4, at 10:00 p. m., the venoclysis was discontinued, having been maintained, aside from minor interruptions due to changing the cannula to a new vein, approximately 150 hours. The patient received an average of 3,000 c. c. of 10 per cent glucose each 24 hours and the total intake was about 20,700 c. c.

The patient's condition continued to improve rapidly and she was dismissed on November 9. The skin, aside from psoriasis, showed general desquamation.

The patient was seen some nine months later. At this time she stated that her psoriasis cleared up about a month after she left the hospital and had started to return only in the last month.

SUMMARY AND CONCLUSION

An instance is presented of a probable marked allergic reaction to typhoid vaccine in an individual previously sensitized.

Many features of the case closely resembled those of arsphenamine dermatitis, there being striking edema and erythema of the skin, followed by desquamation. There was evidence of severe renal and moderate hepatic damage.

All manifestations subsided rapidly during the prolonged administration of 10 per cent glucose solution by venoclysis.

It was felt that the method of treatment used was a determining factor in the favorable outcome of the case.

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DISCUSSION (*Abstract*)

Dr. L. Williams Lord, Baltimore, Md.—Dr. Rosen has quoted from Dr. Hench, that at the Mayo Clinic aproximately 10,000 injections of typhoid vaccine have been given intravenously in a group of about 2,500 cases, and in only twenty injections did untoward reactions result, an incidence of one-fifth of 1 per cent. He also mentions that death occurred in three cases. It is this point that I wish to bring to the attention of the Section. He did not mention the diseases for which the patients received the injections in Hench's report, but it is mentioned that they were given on the arthritic and dermato-syphilogic services. I made a point of reading the article by Hench and find that the injections which he gave were for arthritic conditions for the most part, but he does not mention for what they were used on the dermatologic service. I believe it is safe to assume that this therapy was used in combating neurosyphilis. I want to call your attention to the fact that all of these are serious diseases, diseases which eventually would cause loss of life or marked crippling. I, myself, have had a not inconsiderable experience with typhoid vaccine therapy, having given or supervised the administration of approximately 2,000 injections in 161 patients, all suffering from neurosyphilis, with two fatalities, but otherwise no unusual reactions.

In psoriasis we are dealing with a disease which, aside from the cosmetic disfiguration which it produces, is a totally benign condition and its cosmetic disfiguration is, of course, not a permanent one, inasmuch as when the condition clears there are no after effects remaining. We are, therefore, dealing with a harmless and benign disease and we are using a drug which is far from being harmless. There is little doubt that typhoid vaccine will produce an involution of psoriasis, as it is the most potent of all our foreign protein shock-producing agents. However, are we justified in exposing a patient suffering from a totally benign disease to an agent which may produce serious reactions and in a certain proportion of cases even death? I think this is a point that many clinicians, in their quite laudable effort to obtain prompt relief for their patients, overlook. Can the cure be worse than the disease? That, in my opinion, should be the criterion as to whether dangerous drugs should be used in the treatment of any specific condition. If the condition is dangerous to the patient and may eventually cause loss of life or crippling, one is justified in taking certain risks. When, however, the disease is a benign one, it is my firm belief that the physician should be very, very careful in the selection of therapeutic measures. We all remember the days when x-ray was used *ad libitum* in the treatment of psoriasis, and those of us who have been in practice for even a moderate length of time have undoubtedly seen the disastrous results which have followed the too liberal use of x-ray in this disease to such an extent that today x-ray is rarely, if ever, used in the treatment of psoriasis. It seems to me that the employment of as dangerous a fever-producing agent as typhoid vaccine is unwarranted in the treatment of this disease. A good plan for the physician to follow, in my opinion, is as follows: "Should this disease occur in my own case or in that of a close member of my family, would I still recommend the treatment under consideration?" If I would, then I should have no hesitation in using it on any patient who consults me for this condition, but if I would hesitate to do so, I am in no way justified in employing it on any individual who consults me, and who is paying me for my services.

Dr. Rosen (closing).—The purpose of this presentation was not to discuss the treatment of psoriasis by foreign protein therapy, but to report the unusual reaction from the intravenous injection of the "triple typhoid" vaccine in a patient previously immunized by the usual subcutaneous route.

CONGENITAL PYLORIC STENOSIS IN SISTERS*

REPORT OF TWO CASES

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The occurrence of congenital pyloric stenosis is not of unusual rarity. Most authorities, however, state that it occurs chiefly in the first-born, and it is said to have an incidence six to ten times greater in boys than in girls. In reporting a case which came to autopsy, Armstrong,[1] in 1777, said:

"What is remarkable, this is the third child (and they never had any more) which the parents lost at the same age and with the same disease."

A strong familial tendency was indicated in but few cases reported in the literature. MacGregor[2] described three cases in children of one family, the fourth child, a boy, the fifth child, a boy, and the seventh child, whose sex was not given. Redgate[3] reported the condition in male uniovular twins. Lapage[4] said:

"Pyloric stenosis may occur in two children of a family, in parent and infant, in twins, or in one twin only."

The cases here presented occurred in two sisters, the first and third of five children, whose parents were American-born Caucasians with a history of unusually good health. The mother had one unmarried sister and the father one brother, married but without children. Nowhere in the family history was there record of an infant having a trouble suggesting congenital pyloric stenosis, nor were there children who died in early infancy. In December, 1936, the mother was 33 and the father 34 years of age; they had been married seventeen years. At that time the second child, a boy born August 15, 1927, the fourth child, a girl born August 22, 1934, and the fifth child, a boy born November 25, 1935, were all normal children, each with a record of unimpaired health.

CASE REPORTS

Case 1.—Betty L. B. (Riverside Hospital No. 9956), the first of five children and a girl, was born on April 21, 1926. The delivery was normal and the child, weighing seven pounds, gave no indication of any abnormality. She was breast-fed and grew steadily without having "indigestion." Her weight on May 21 was nine pounds, four ounces. On May 18, however, she began vomiting at regular intervals. The type was projectile. Two vomiting spells during the first four weeks were not severe enough to attract particular attention, but when the vomiting became regular and the projectile characteristic evident, on May 23 the mother became alarmed and consulted Dr. Fred Barfield. After that time the child retained practically no food. The longest period of retention was one and one-half hours, and at times she appeared to retain water. For three days prior to admission to the hospital the vomiting occurred as soon as she swallowed. For ten days she had been very constipated, and despite the use of oil and suppositories, she had for two days had no stool at all. Nothing abnormal had been noted about the appearance of the abdomen. Belladonna had been given for two days without apparent effect.

The patient was admitted to the hospital on June 9, 1926. Physical examination showed a fairly well nourished baby, crying and straining, but not apparently desiccated. When she was nursing from a bottle, there was only an indefinite suggestion of fullness in the epigastrium and peristaltic waves were passing from the left to the right side. On palpation, after a second trial, a hard nodule was felt in the upper right abdomen. Though difficult to distinguish from the spastic right rectus muscle, it felt as if it were about the size of the terminal phalanx of one's little finger. Abdominal examination was otherwise negative.

Roentgen studies were begun by giving the patient from a bottle three ounces of a mixture of barium and water, a large part of which was immediately vomited. Fluoroscopic observation showed that about one-fourth of the mixture remained in the stomach and that none passed out during several minutes of fluoroscopy. Projections were made every fifteen minutes for the first hour and repeated on the hour from the second through the fifth hour. Observation at the third hour showed for the first time that a minute amount of barium had passed through the pylorus. At that time one five-hundredth grain of atropine was given by mouth. Little if any more barium had passed through at the fourth and fifth hours. The baby was then given additional barium and allowed to nurse, but again vomited a considerable portion. One hour later a second dose of atropine in like amount was given. Observations were carried to the third hour after the second feeding, which was the eighth hour after the first. The last observation showed that not over one-tenth of the barium retained had passed through the pylorus during the entire period. The roentgen findings pointed definitely to an organic pyloric obstruction, very probably in so young an infant congenital pyloric stenosis.

A diagnosis of congenital hypertrophic stenosis was made, and the patient was operated upon the next morning. A right rectus incision one and one-fourth inches in length was made in the abdominal wall. With a hook the pylorus was delivered out of the abdomen. An area of hard, elastic tissue having sharply defined edges and more of a glistening yellow whiteness than the surrounding tissue was found extending from the pyloric ring about three-fourths of an inch backward into the fall of the stomach. From the edge of this area an incision was made down past the pyloric sphincter and through the muscle layer of the wall. The mucous membrane then unfolded and bulged through the gap. A flap of omentum was brought up over this membrane

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and fastened with interrupted sutures. The abdominal wall was closed in layers.

The patient was put on routine postoperative regime. She did not vomit another time and made an uneventful recovery.

When examined on December 12, 1936, ten and one-half years after the operation, this child was four feet, seven inches tall and weighed eighty-three pounds. The abdominal wound was solid, and the child was apparently in excellent health.

Case 2.—Barbara B. (Riverside Hospital No. 14,454), the third of five children and the second girl, was born February 15, 1933. The delivery was normal and the child progressed normally until March 10, when she began to vomit. Although not projectile in type, the vomiting was very forcible and grew progressively worse from March 15 to 19. On the latter date the mother stated that the baby had not been retaining over one-fourth of all liquids taken and that for the previous twenty-four hours she had vomited practically everything. She did not think the child had lost weight, but stated there had been no satisfactory bowel movement for a week, although with the aid of suppositories there had been an occasional small stool. Belladonna had had no effect.

When admitted to the hospital on March 19, the child was apparently not dehydrated. She was crying except when taking water from a bottle. Physical examination showed general distention of the abdomen, the epigastrium seeming a little more distended than the lower portion. At intervals peristaltic waves were discernible, beginning at the left costal border, passing across the abdomen and disappearing under the right costal border. On palpation with the thighs flexed, a lump was felt in the right epigastrium. It was cylindrical in shape, hard and smooth, apparently not tender, and its position was in the direction of a line running from the umbilicus to the right costal border. Effort to detect such a lump on the previous day was without result.

Roentgen studies supported the tentative diagnosis of congenital pyloric stenosis. Following a barium meal the stomach appeared to be well filled with a dense barium mixture and active peristalsis was seen. Numerous films were made in various positions at one, two and three and one-half hour intervals. The stomach was less than 50 per cent empty at the end of the three and one half hour period, and several films showed constriction of the lumen of the pylorus.

On March 21, the child was operated upon. The stomach was normal in appearance except for enlargement of the pylorus. The enlarged section was about one inch long and three-eighths of an inch in diameter, involving the whole pyloric region. It was pinkish pearl in color and had no visible vessels within it. On palpation it was very hard with almost cartilaginous firmness. A Rammstedt operation was performed.

Under routine postoperative regime the patient did not vomit again and made an uneventful recovery.

When examined on December 12, 1936, approximately three years and nine months later, the child looked well and weighed thirty-three and one-half pounds. Her mother considered her in perfect health.

In this family of seven, the parents and the five children had consistently been free of any illness of consequence except the cases of congenital pyloric stenosis occurring in the first and the third of the children, both girls.

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Riverside Hospital

UTERINE RUPTURE INVOLVING THE VAGINA AND BLADDER, WITH RECOVERY*

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Many cases of uterine rupture have been reported in the literature,[1] but bladder complications along with this type of injury are rare.

Mrs. S. K., age 40, white; was admitted to the Baptist Memorial Hospital, September 25, 1933, complaining of abdominal pain and bleeding.

The menses began at 13 years of age; periods were irregular, from 3 to 4 weeks apart; of three days' duration; the flow was normal; there was no dysmenorrhea.

She had borne nine children, seven of whom were living. The youngest child was 2 years of age. The health of the living children was good, and the two dead had been stillborns (cause unknown).

The previous labors were all difficult, but there was no history of any operative procedure.

Present Obstetrical History.—The last normal menstrual period was December 12, 1932. Quickening was noticed about the first of May, 1933. The estimated date of confinement was September 19, 1933. There was no history of nausea, vomiting, headache, edema, or leukorrhea. There were no urinary symptoms, and the bowels were regular.

Labor began about 11 a.m., September 24, 1933, with the pains increasing in frequency and intensity. The membranes ruptured spontaneously, and the head began to engage about 4:30 p.m., when suddenly the pains ceased and were supplanted by a continuous abdominal pain. The patient claimed to have last felt the baby move about noon, September 24, 1933. The family physician gave her morphine sulphate, grains ¼,

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and atropine sulphate, grains 1-150, about 4:30 p.m. The patient made no progress, and she was brought to Memphis, and arrived at the Baptist Memorial Hospital about 3:30 a.m., September 25, 1933.

She was seen in the emergency room, and the above history obtained. An examination showed the small parts to be in the fundus with the head engaged, but the fetal heart was not heard. A rectal examination was done, and the head was found engaged, a very thin cervix, and she was admitted to the obstetrical service with a diagnosis of deep transverse arrest with the vertex presenting.

The intern on obstetrical service found that her pulse was 110 and her respirations 40 a minute, and she was bleeding profusely from the vulva.

The patient was seen by me about 4:30 a.m., September 25, 1933, and at that time her abdomen was hard with the head in the pelvic inlet, there were no uterine contractions, and a laceration of the uterine wall was felt in the left lower quadrant. She was also bleeding profusely from the vulva, appeared pale, and seemed quite shocked. She was sent immediately to the delivery room, and given 750 c. c. of 5 per cent glucose intravenously.

The patient was prepared in the usual manner, but when she was catheterized, pure blood was obtained from the bladder, and the catheter was seen to pass from the bladder into the vagina. On examination, the anterior wall of the vagina was found to be torn from one pubic ramus to the other, completely into the posterior wall of the bladder. The cervix was completely dilated and effaced. The patient was anesthetized; the fetal head pushed up; and a hand inserted into the uterus. A laceration of the uterine wall could easily be felt, extending from the left side of the cervix to the region of the left round ligament and out into the left broad ligament. A dead fetus was easily delivered by internal podallic version, and breech extraction with the use of Piper's after-coming head forceps. The placenta was obtained manually, and the patient was given pituitary extract and ergot (one ampule each), and 750 c. c. of 10 per cent glucose intravenously. The patient was also given 500 c. c. of whole blood while on the table. She responded nicely to this, and the bleeding practically stopped.

An examination of the placenta showed one edge to be missing, and that the membranes were torn loose from the placenta except for about two inches. Neither the missing membranes, nor the missing piece of placenta were found in the uterine cavity.

A urologist was consulted in regard to the bladder condition, and he agreed that the best method of repair would be by abdominal laparotomy

The family physician, who accompanied the patient, was closely questioned, but we were unable to obtain any history of manipulation, prior to admission. However, we were able to find out that the patient was given several "shots" during her labor, which did not put her to sleep. The nature of these "shots" we were unable to determine.

The patient was kept sedated with morphine sulphate, and by 3 p.m., September 25, 1933, her shock appearing less, her abdomen was opened by a lower midline incision. The abdomen was found full of blood, urine, pieces of membranes and a small piece of placenta. There was extravasation of urine into both broad ligaments, and both ovaries were very cyanotic. The uterus was seen to be torn on the left lateral wall, the laceration extending from the cervix to the left round ligament, with the tear extending across the anterior vaginal wall. The bladder was split entirely across its upper and posterior walls. From the abdominal incision it was possible to look either into the uterine cavity, the bladder, or the vagina.

A supravaginal hysterectomy and a bilateral salpingo-oophorectomy were done, and the stump of the cervix sutured and covered with peritoneum after the abdomen had been thoroughly cleaned of urine, blood, membranes, and placenta. The bladder wall was repaired, and a retention catheter inserted.

One tube and a cigarette drain were inserted into the cul-de-sac, and a tube drain was inserted through the cervical stump into the vagina.

The abdominal wall was closed in layers.

The patient's condition was poor throughout the operation, and immediately following the completion of the operation she was given 350 c. c. of whole blood before being removed from the table.

Pathological Report.—The specimen consists of a gravid uterus at term which measures 22 by 15 by 9 cm. It weighs three pounds. The cervix is markedly swollen, quite soft, and shows considerable dark hemorrhagic discoloration. There is a tear through the cervical wall, extending up through the left lower uterine segment into the broad ligament. The tear is about 12 cm. in length. The edges of the tear are slightly irregular, covered with a dark blood clot, and considerable fluid. The left ovary, tube, and parovarium are infiltrated with extravasated blood and fluid. The ovary is small, measuring 3 by 2.5 by 1 cm. The right adnexa have practically the same appearance, except there is not quite so much infiltration throughout the broad ligament. The uterine cavity shows considerable dark hemorrhagic discoloration, a small amount of membrane and small fragments of placenta. The anterior uterine wall is 4 cm. in thickness as compared to 2 cm. in thickness at the fundus, and seems rather fibrous.

Pathological diagnosis was a ruptured gravid uterus.

The patient's general condition responded rapidly after the operation, but she continued to run a rather septic temperature.

On September 28, 1933, the vaginal tubes were removed, and a white blood count showed 4,150 white cells with 85 per cent polymorphonuclear leukocytes. No malaria organisms were found. On September 29, the abdominal drainage tubes were removed, and the wound showed a slight infection with a moderate amount of urinary drainage.

The patient continued to run a septic temperature, and a blood culture was taken which was negative. Four malaria smears were negative, and a Widal test was negative. The fifth smear for malaria was positive for estivo-autumnal malaria organisms. The patient was put on atabrin and plasmochin. She continued to run a temperature of a septic type, but lower than before treatment for malaria began. On October 14, 1933, an

x-ray of the chest showed increased bronchial changes at the right base, but was otherwise negative.

The temperature continued to come down, the pulse improved, but she continued to run an occasional temperature up to 100°. On October 21 she became jaundiced, and an icteric index was done. It showed 7.2. The infection of the abdominal wound rapidly cleared up, but there remained a small urinary fistula, although her general condition was good. She was discharged on the twenty-ninth day postoperative, and was told to return in one month.

She returned to the Baptist Memorial Hospital on November 28, 1933, for cystoscopic examination. The temperature, pulse and respiration at this time were normal. Physical examination showed a small, draining sinus in the lower edge of the abdominal incision. The pelvic examination was negative.

Blood examination showed: hemoglobin, 45 per cent; red blood cells, 2,500,000; white cells, 14,400; small lymphocytes, 19 per cent; polymorphonuclear leukocytes, 81 per cent.

Urine examination: albumen, a trace; pus cells, numerous; epithelium, 1+; occasional blood cell per high powered field; bacteria, 2+.

A cystoscopic examination was done on December 2, 1933, under local anesthesia.

The cystoscopic examination showed that the right ureteral orifice was normal in position and appearance. A catheter was passed into the right ureteral orifice easily. An obstruction was found about 1.5 cm. inside of the left ureteral orifice, and neither a number 4 nor 5 catheter could be passed. There was a shelf-like deformity in the region of the trigone, and the old suture line was evident. The bladder wall showed some mucosal injection.

Cystoscopic diagnosis showed an old deformity of the bladder from repair of an old rupture. There is an obstruction of the left ureter.

On December 4, 1933, a pyelogram with skiodan was done. The five-minute plate showed fairly good secretion from the right kidney; very little from the left.

The fifteen-minute plate showed a fairly good outline of the right kidney pelvis and calices, and the right ureter to just above the bladder; the left kidney pelvis was just beginning to show up.

The thirty-minute plate showed that the left calices are considerably dilated, and there was an insufficient amount of opaque substance in the ureter to outline it. No further follow-up of the pyelogram was done.

The patient was discharged December 5, 1933, with a diagnosis of probable hydronephrosis (left) due to obstruction of the left ureter, and a moderate bladder deformity following repair of a ruptured bladder.

The patient has not been seen or heard from since her discharge in December, 1933.

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POTASSIUM PERMANGANATE POISONING*

REPORT OF FATAL CASE

By CHRISTOPHER JOHNSTON, M.D.
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Although it is well known that potassium permanganate in sufficient concentration can have an extremely caustic action on the mucous surfaces which may lead to severe ulcerative lesions, it seems remarkable that a survey of the literature should fail to reveal a single report of a fatal case of potassium permanganate poisoning in the United States. The scarcity of fatal cases is due probably to the intensity of the color developed by even weak solutions, so that the individual who swallows some of the fluid with suicidal intent rarely makes up a solution of strength sufficient to cause damage. All of the fatal cases so far recorded have followed ingestion of the chemical in solid form.

Box[1] reported a case in which death followed within 25 minutes of the taking of a "handful," washed down with a teacup full of beer. He was able to find but one other case recorded, that of Thomson,[2] in which a "large" dose of solid $KMnO_4$ caused death in five hours. Rubin and Dorner[3] reported a case in which the ingestion of an unknown quantity resulted fatally in fifty hours. These three cases were characterized by intense hyperemia with edema and corrosion of the mouth, glottis, esophagus and stomach. The case recorded by Box showed edema and congestion of the lungs and the case of Rubin and Dorner showed bronchopneumonia at autopsy.

In 1914, Adler[4] reported a fatal case closely resembling the one herein presented. This patient was seen one hour after swallowing 10 grams of solid $KMnO_4$. Respirations were irregular and during the periods of apnea which lasted 20 seconds, the pulse rate fell from 72 to 44. There was severe pain in the esophagus and marked swelling and discoloration of the tongue, tonsils, uvula, pharynx, epiglottis and larynx. Two days later the temperature rose and death resulted apparently from bronchopneumonia. Autopsy showed ulceration of the buccal mucosa, tongue, pharynx, epiglottis and larynx. The pharyngeal wall was completely destroyed. A

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few superficial lesions were found at the cardiac end of the stomach. There was severe hemorrhagic tracheitis and bronchitis with bronchopneumonia.

CASE REPORT

M. H., a white man of 28 years, swallowed an unknown quantity of solid potassium permanganate. Almost immediately he collapsed and was taken to a hospital elsewhere. His mouth and throat became very sore and swollen so that he was unable to swallow any liquids or other nourishment and he had had some respiratory difficulty.

On admission, two days after taking the chemical, the temperature was 39.8° C., pulse 160 and respirations 24. There was a spasmodic cough productive of a thick tenacious mucopurulent material containing dark flecks. The skin surrounding the mouth was covered with dark crusted scabs and the lips were raw and necrotic. The tongue was greatly swollen and the buccal mucosa was raw and covered with necrotic tissue. There were moderate respiratory stridor and loud tracheal rattle. The heart was apparently normal and the blood pressure 110/70. The remainder of the examination showed no abnormalities.

For eleven days his condition changed little and he was unable to talk or to take food. The membrane remained over the buccal mucosa and the soft palate looked as though it had been preserved in formaldehyde. Fluids were administered subcutaneously and glucose was given intravenously. Signs of bronchopneumonia appeared at the right lung base and he continued to expectorate large amounts of mucopurulent sputum.

Thirteen days after taking the potassium permanganate a Stamm-Kader gastrostomy was performed in order to prevent starvation, as he had been quite unable to swallow any food. However, the fever continued and there were signs of definite increase in the bronchopneumonia. On the fifth postoperative day there was a hemorrhage of approximately 150 c.c., apparently from the esophagus, and this was repeated on the sixth day. On the seventh day the bleeding was more profuse and in the evening a sudden large hemorrhage was followed by collapse and death. Autopsy was not permitted.

On admission the hemoglobin and red count were normal and the white blood cells 9,400. Subsequently a leukocytosis of 10,000 to 13,240 developed, apparently due to the bronchopneumonia and the ulcerative lesions of the mouth. Urine showed a small amount of albumin on admission, but none on ten subsequent examinations. The specific gravity of single specimens varied between 1.019 and 1.034. Glycosuria, which was found on six occasions, was probably due to the administration of glucose intravenously. The plasma nonprotein nitrogen was within normal limits on three occasions and the van den Bergh gave a prompt biphasic reaction. Bilirubin was 2.9 mg. per cent. Stools showed no occult blood on the second and fourth days. The sputum showed no spirochetes on darkfield examination and the sputum culture showed a wide variety of organisms, *Staphylococcus albus* and *aureus, alpha* hemolytic streptococci, *Micrococcus catarrhalis,* pharyngis siccus, Friedlander's bacillus and a few colonies of *beta* hemolytic streptococci being reported. A single blood culture was sterile.

This patient died, not from either potassium or manganese poisoning, but from the caustic action of potassium permanganate in solid form which caused necrosis of the tissues of the mouth and esophagus and finally erosion of the esophagus leading to a fatal hemorrhage. Severe tracheitis and bronchitis, leading ultimately to bronchopneumonia, appears also to be a part of the picture as indicated by this case and the other reported cases to which reference has been made.

Potassium permanganate, although not usually regarded as a dangerous preparation, will cause severe damage to the tissues, and even death, when applied in concentrated form. In all of the fatal cases so far recorded it has been taken with suicidal intent.

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DUGAS ON SURGICAL PRINCIPLES*

A MANUSCRIPT OF 1874

By CECILIA C. METTLER, A.M.†
Augusta, Georgia

Dr. Louis Alexander Dugas, M.D., LL.D. (1806-1884), held the Chair of Surgery at the Medical College of Augusta (the present University of Georgia School of Medicine) from 1855-1882, was Dean for a period of twenty years and editor of the Southern Medical and Surgical Journal (the first medical periodical in the South) from 1851-1858. Eponymously he is remembered for his famous sign indicative of dislocation of the shoulder joint. During his professional career he published approximately one hundred articles, which are a credit to his surgical versatility and the wide range of his medical knowledge. The paper which follows is one of several Dugas manuscripts which have recently come to light.

"REPORT ON THE PRINCIPLES OF SURGERY

By Louis A. Dugas, April 20, 1874

"The great advance of our times in the principles of Surgery as well as of medicine is to be found in the

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substitution of conservation for destructive and disintegrating medication, and in the use of Specifics in lieu of agents whose action is more or less conjectural. By conservative Surgery, as we should understand at present, we mean much more than the occasional saving of a limb which might have been sacrificed by less judicious management: we mean such a course of treatment as will prevent or overcome morbid action by sustaining or improving the stamina which is to restore health. The practice of which this has taken the place was essentially destructive or disintegrating, for all its agents were calculated to impair the stamina and to undermine the vital energies. Among those agents blood-letting, local and general, was long esteemed the most potent. But if to this you add emetics, cathartics, diuretics, nauseants, mercurialization, starvation and finally blistering, it will be apparent that it was sought to restore health by overcoming or destroying the vital stamina. The wonder is that there ever were any recoveries under such a plan of treatment.

"In the early portion of my professional career those who had to be subjected to a surgical operation were required to undergo a preparation more or less rigid according to the gravity of the case. They were accordingly kept upon low diet, occasional purging, and alteratives whose office was understood to be to excite the absorbents and to correct the secretions. This was continued until the anemic condition thus induced proclaimed the patient in a good state for the operation. You know that this is all changed with those who keep pace with the progress of knowledge; that the preparation for an operation now consists in such tonics and nourishing diets as will build up the patient for the expected ordeal and enable him to withstand the shock as well as the subsequent developments.

"The next great step toward success in the management of disease, that by the use of *specifics* instead of *conjectural* remedies, is of slow growth. Conservative medicine commenced about forty years ago, and is just becoming a fixed conviction with the profession. This use of specifics probably had its origin with the discovery of quinine, when it was demonstrated that with it we had acquired the mastery of all the so-called malarial affections, and that with it alone we might safely abandon the absurdities of the antiphlogistic treatment. Diseases supposed to be essentially inflammatory were shown not to be so and to yield more readily to quinine than to bloodletting and other depletions.

"The only true test of knowledge is our ability to predict results. It is said that astronomy is a positive science because we are enabled to predict many of its phenomena with unerring certainty. We know that it is by the application of mathematics to astronomy we foretell eclipses with a degree of accuracy well calculated to astound the ignorant. Can we ever expect to predict results with regard to remedial agents with equal certainty? In answering this question we must remember that the astronomer has to deal with bodies whose status is fixed or so imperceptibly altered by the lapse of enormous periods of time as not materially to affect results; whereas, in dealing with the human body we find mutation so frequent and so rapid as to interfere frequently with our predictions. And yet, in the case of quinine and many other articles of the Materia Medica the specific effect is so uniform that we can predict results with a reasonable and eminently useful degree of certainty. We may give quinine and rarely fail in our prediction of effects; and the same may be said of many of the articles classed as Emetics, Cathartics, Narcotics, Stimulants, Antipyogenics and Improvers. So long as we confine ourselves to the use of such agents we avoid uncertainties and luxuriate in the consciousness that we know what we are about.

"How different the use of Diaphoretics, Expectorants, Alteratives, Antispasmodics, Diuretics, Emmenagogues, Scialogogues, Cholagogues, Hydragogues, etc. Who can predict the effect of either of these articles, or of the promoters of absorption and correctors of secretions upon which we formerly relied with a degree of complacency which is perfectly ridiculous from our present standpoint. None but those who have abandoned the use of these unreliable agents and confine themselves alone to specifics can form any idea of the relief experienced in passing from vagueness to certainty, from conjecture to knowledge and from danger to safety."

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C. P. LORANZ, Secretary, Treasurer and General Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Thirty-First Annual Meeting
New Orleans, Louisiana, November 30-December 1-2-3, 1937

THE NEW ORLEANS MEETING

There is a general belief that if men can meet one another in good spirit to discuss their problems and differences, these will largely disappear. One of the chief functions of a scientific meeting is to provide a friendly atmosphere for social gatherings and intimate acquaintance, and no group of men has achieved the cooperative and comradely spirit so well as have the members of the Southern Medical Association. The Southerner is hospitable to the stranger within his gates; the new idea which knocks at his door is likewise invited in and approached with a kindly spirit which is likely to bring out what is true in it. The increasingly stellar role which the South has played in scientific advance of the past few years is an outstanding tribute to its men and methods.

Section programs for the thirty-first annual convention of the Southern Medical Association are rapidly being closed. Space for scientific and technical exhibits in New Orleans is very nearly all filled. The oldest and most charming large Southern city is making every possible preparation for the reception of its November guests.

The medical profession of New Orleans is known throughout the South. Tulane and Louisiana State University medical schools will draw physicians from every portion of America and from countries to the south. Both schools have developed extensively since the last meeting of the Southern Medical Association in New Orleans in 1931. Extensive new hospital facilities have been provided for the city.

Physicians who have not already made hotel reservations for the convention should do so at the earliest possible moment, since the number of available rooms is limited. The dates are November 30-December 1, 2, 3.

BONE MARROW AND AMIDOPYRINE

Kracke,[1] of Emory University Medical School, has reviewed the history of agranulocytosis and investigated its etiology over a period of years. It is a disease characterized by absence or a greatly reduced number of granulocytes in the circulating blood, usually accompanied by sore throat, and frequently fatal. It was recognized first in 1922, became rather widespread shortly after, and displayed a predilection for members of the medical and nursing professions and their families. Amidopyrine was shown to have been taken usually before symptoms developed.

This drug is a common component of many prescriptions and patented preparations for respiratory infections and for relief of pain, and is thus ingested in large amounts by the general public. Certain individuals appeared to have a peculiar susceptibility to it, and to respond with failure of the white blood cell forming tissue; however, the clinical relationship was not demonstrable experimentally. When this drug was given to animals, bone marrow injury could be shown, but the number of circulating white blood cells was not affected. Agranulocytosis could not be induced in the laboratory.

Miller and Rhoads,[2] of the Rockefeller Institute, have made studies upon dogs which throw some light upon the possible mechanism of injury by this coal tar derivative, and upon the reasons for individual susceptibility.

Dogs on Goldberger's black tongue diet (without his "pellagra preventive factor") develop an acute stomatitis, and occasionally the number of

1. Kracke, R. R.; and Parker, F. P.: Agranulocytosis: Etiology, Diagnosis and Treatment. Sou. Med. Jour., **28**:915 (Oct.) 1935.

2. Miller, D. K.; and Rhoads, C. P.: Effect of Diet on the Susceptibility of the Canine Hematopoietic Function to Damage by Amidopyrine. Jour. Exper. Med., **66**:367 (Sept.) 1937.

granulocytes is diminished. In the bone marrow there is a reduction of the hematopoietic elements.[2] The authors considered it possible that a faulty diet, of the pellagra-inducing variety, might increase the susceptibility to injury by amidopyrine. They tried the combination of simultaneous dietary deficiency and drug poisoning, to see whether symptoms might be thus exaggerated or intensified. Ordinarily dogs on Goldberger's ration develop black tongue after five to ten weeks. A mild anemia accompanies the canine disease. If, in addition to the deficient ration, half a gram of amidopyrine a day was administered, anemia and stomatitis developed much more rapidly; they were severe in ten days, or about four times as quickly. The number of erythrocytes fell rapidly to 50 per cent or less, and hemoglobin also dropped. There was no granulopenia, but bone marrow injury was evident, with interference with maturation of both red and white cells. The notable change in the circulating blood was reduction of the erythrocytes, not agranulocytosis. The white cells in the blood stream remained apparently unaffected. The bone marrow resembled that seen in benzol poisoning, or in some cases of aplastic anemia. This appearance and the rapid development of symptoms were not obtainable with the deficient ration alone, or simply by feeding large amounts of amidopyrine, but susceptibility to the drug was very obviously increased by the black tongue diet. Miller and Rhoads suggest that the ration rendered the body incapable of detoxifying this aromatic compound.

It has been shown by Lamson,[3] of Vanderbilt, that a deficiency of calcium in the diet makes the liver more liable to injury from certain chemicals, such as carbon tetrachloride. From the work of the New York investigators one would conclude that vitamin G deficiency may increase the liability to bone marrow injury by a coal tar derivative, amidopyrine. There is no reason to believe that a single dietary factor is responsible, however, in the dog or the human. A combination of amidopyrine with any synergistic method of bone marrow injury might enhance the effects of the drug. The conclusive demonstration of the harmful results when a G-deficient ration is given in combination with this particular sedative may be of clinical significance.

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X-RAY FOR AMENORRHEA AND STERILITY

Because the x-ray very readily injures fetal tissue, and may cause developmental deformities, radiation of human ovaries during the childbearing period is regarded with disfavor in many quarters. According to Ira Kaplan,[1] of New York, x-ray therapy to the ovaries and in some instances also to the pituitary, has a definite value in cases of sterility and amenorrhea. He has employed it over a considerable period with good results, in a group of patients who had failed to respond to prolonged endocrine treatment.

It is difficult to offer a logical explanation for these results. Taylor, discussing them, suggests that before irradiation, the condition of the ovary should be accurately diagnosed by measurements of the estrin level in blood and urine. The hyperfunctioning, rather than the hypofunctioning ovary he thinks might be amenable to radiation.

There is still much dispute on this subject, and the results can be evaluated only by time. It is of interest that in the group of patients reported there was no evidence of ill effect of radiation upon subsequent pregnancies.

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ANDROGENS AND ESTROGENS: NATURE AND SOURCE

The chemistry and physiology of sex has occupied a considerable portion of scientific literature of the past few years, since the isolation of various hormones concerned in the production of secondary sex characteristics of mammals, birds and fish. It was rather surprising that identical chemical products could be obtained from many varieties of living organisms, which could induce comparable physiologic effects in individuals of widely different genus. Animal proteins, for example, hemoglobin, are very specific: human and beef or rabbit hemoglobin are biologically different and incapable of functioning for one another. But gonadal hormones from many living sources stimulate the reproductive tissues of almost any host. A group of products which may be called androgens, from the testicle, induce male secondary sex characteristics; estrogens, from the ovary, induce the appearances and behavior of femininity. An

identical product from the anterior pituitary may stimulate either ovary or testicle, but the two varieties of gonadal hormone are sharply differentiated. Although androgens and estrogens are similar in chemical structure, theelin never induces comb growth in a cock or capon, and the androgens do not induce the feminine type of feathering.

Clinically, estrogens and androgens are excreted normally by both men and women. According to University of Chicago workers,[1] there are marked individual daily variations in the urinary excretion of the gonadal hormones, but the normal woman excretes about two-thirds as much androgen as the normal man; the man about a third as much estrogen as the woman. It has been attempted to learn the source of these secretions of the opposite sex.

According to Hill,[2] of Yale University, under certain conditions a grafted ovary may actually produce testicular effects, and thus presumably testicular hormone, in a castrated male mouse. An ovary grafted inside the abdomen of a male mouse produced no hormone; if grafted into the ear, it survived and activated the male sex accessories, the seminal vesicles and prostate. The author suggests that gonadal activity depends upon the temperature of the surroundings. If castrated mice, with ovary grafted into the ear, were kept in a hot room, that is, at 33 degrees centigrade, over several months, there was no testicular effect; the seminal vesicles and prostate remained castrate in type. If animals were kept in a room of 22 degrees, the externally grafted ovary took on testicular function, producing the male hormone and maintaining the mouse accessory tissues in normal condition. There were no cyclic effects such as characterize the female animal, but apparently continuous secretion of male hormone by the ovary.

It has been suggested that the undescended human testicle atrophies because of the high temperature inside the living body. This work would seem to present experimental confirmation of the hypothesis, as well as proof of the profound effect upon living tissue, of a change in the surrounding temperature.

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TWENTY-FIVE YEARS AGO

From Journals of 1912

British and American Food and Drug Laws.[1]—"The Federal Food and Drugs Act, popularly known as the 'pure food law,' contains this clause:

"'The term "misbranded" * * * shall apply to all drugs * * * the package or label of which shall bear any statement * * * which shall be false or misleading *in any particular.*'

"For nearly five years after this law was passed, the court held, and the 'patent medicine' manufacturers and the people believed, that this statement naturally meant that it was illegal to make any kind of false claims on the label. Then came the Supreme Court's decision declaring that what the law really meant was that false statements regarding composition and source of origin were prohibited, but that no cognizance should be taken of falsehoods that were confined to the curative effects claimed for nostrums. The decision was not unanimous, three out of the seven Supreme Court justices dissenting therefrom. * * *

"In one phase alone, that of truthfulness in labeling, the results of the act have been marked. We know of no better way of showing what the law has done to protect the American consumer than by comparing the labels on 'patent medicines' today with the same labels of six or seven years ago. This comparison is most easily made by placing in juxtaposition the American and English labels of those nostrums made in the United States that are sold on both sides of the Atlantic. For the English label of today is the American label of six years ago. The British law, while protecting the purchaser of haberdasheries or groceries from misrepresentation and fraud, is a dead letter so far as its application to the sale of 'patent medicine' is concerned* * *."

German Council on Pharmacy and Chemistry.[2]—"Our German confreres have finally come to recognize the evil connected with the proprietary medicine business and the extent to which this is a detriment to the progress of medicine. This in no small way has been brought about by the reports of the Council on Pharmacy and Chemistry and by the *Journal's* propaganda. * * * has finally culminated in the establishment of a German Council on Pharmacy and Chemistry."

Treatment of Falling Hair.[3]—"* * * should include attention to the general health with a view to removing auto-intoxication by diet (chiefly carbohydrate, the use of buttermilk, etc.), removal of constipation, and the stimulation of the kidneys if needed."

Epinephrin in Poliomyelitis.[4]—"* * * a subdural injection of epinephrin is capable of producing a marked change in the character of the paralytic phenomena in experimental poliomyelitis * * * an improvement in the muscular tonus of the paralyzed muscles and in the respiratory movements. In some animals * * * the effects were striking and a state of extreme flaccidity and unconsciousness with almost complete disappearance of reflexes was succeeded by one of tonus, of strengthened reflexes and of return of consciousness."

1. Propaganda for Reform. J.A.M.A., **59**:209, 1912.
2. Ibid, p. 291.
3. Queries and Minor Notes. J.A.M.A., **59**:293, 1912.
4. Clark, Paul F.: The Action of Subdural Injections of Epinephrin in Experimental Poliomyelitis. J.A.M.A., **59**:367, 1912.

Hot Air for Diphtheria.[5]—"Recent investigations by Rendu indicate that inhalation of hot air may become a valuable ally in the treatment of diphtheria * * * diphtheria patients were exposed to a temperature of 176° F. for five minutes with satisfactory results * * * this measure markedly inhibits the growth of the bacteria and shortens the course of the disease."

A Radical Treatment of Tetanus.[6]—"* * * 500 c. c. of blood were removed and the same quantity of salt solution infused in the patient. Now lumbar puncture was made, the cerebrospinal fluid allowed to escape completely drop by drop, the canal washed out with salt solution containing 0.3 per cent sugar, and finally some of the fluid was left in the canal. * * * Pronounced symptoms having developed anew, 300 c. c. of blood were withdrawn on the next day, and lumbar puncture again made as before. On the third day * * * fourth day * * * sixth day bleeding and spinal puncture were repeated. There were no further symptoms and the patient recovered. * * * By these means an occasional life may be saved. In hydrophobia also the trial of similar radical methods merits consideration."

A Family Medicine Cabinet.[7]—"The family medicine cabinet, if not neglected, is a very necessary convenience in properly regulated families. * * * The list follows:

"1. Picric acid, grs. xx
Alcohol * * *
Water * * *
2. Tincture of aconite root, one ounce
3. Tincture of gelsemium, one ounce
4. Tincture of iodine, one ounce
5. Oil of cloves, one ounce
6. Carbolic acid, one ounce
7. Alcohol, four ounces
8. Castor oil, four ounces
9. Turpentine, four ounces
10. Hydrogen peroxide, four ounces
11. Epsom salts, two ounces
12. Mustard, two ounces
13. Boric acid, two ounces
14. Quinine pills (2 gr.), 100
15. Calomel triturate tablets (gr. 1/10), 100

"Of late years I forbid the use of the thermometer. Its disadvantages outweigh its usefulness, and it occasions a great deal of unnecessary worry and anxiety."

5. Current Comment. J.A.M.A., **59**:376, 1912.

6. Ibid.

7. Charbonneau, Lionel C.: A Family Medicine Cabinet. N. Y. Med. Jour., **96**:25, 1912.

New Orleans—Where We Meet

NEW ORLEANS AS A MEDICAL CENTER*

In New Orleans, where the Southern Medical Association will hold its annual convention November 30 through December 3, an amazing forward step in world hospitalization practice is taking place. Construction is under way on the new $12,500,000 Charity Hospital, replacing the 104-year-old structure where the indigent sick and injured of the city were formerly cared for. On completion, in December, 1938, the city will have a hospital whose innovations will doubtless be copied throughout the civilized world.

With $12,500,000 the State is constructing one of the finest, most efficient hospital plants in the world. The main structure, of striking modernistic design in stone and concrete, will tower ten stories in its central section, with graduated offsets going up sixteen and eighteen stories. About the building will be various offsets, providing for glass-enclosed sun porches, offices and other facilities.

On the first floor at the rear will be the emergency admitting and operating rooms, set about the emergency entrance for automobiles and ambulances. Also on the first floor will be clinic entrances, the social service department, record, conference and waiting rooms, the administrative offices and a number of medical offices.

On the second floor, plans call for a cancer clinic, a milk laboratory, a cardiac clinic, storerooms and supply space and the genito-urinary, orthopedic, pediatric and other departments. There will also be a special room in which mothers may be given instruction in diet for children under treatment. On the third floor will be treatment rooms, the hospital museum, staff conference rooms, the photography, bacteriology and pathology departments and other medical quarters.

Wards will be situated on the fourth through ninth or tenth floors and care has been taken to provide maximum bed space. Hospital capacity will be 2,460, a figure which it is estimated will be sufficient for the next twenty years. Children's and adults' quarters, treatment rooms, linen closets and sun porches take up the floor space.

Above these floors are the operating rooms, and occupying floors set back from the others will be obstetrics and maternity rooms and staff quarters. About the grounds will be several new structures, to supplement the six modern buildings of the old hospital which are being retained.

Thus are being augmented New Orleans' already fine medical facilities, which consist of nineteen separate general and specialized institutions, maintained by private funds or by the city, State or National governments. Prominent among the hospitals are Touro Infirmary, Hotel Dieu Hospital, Southern Baptist Hospital and Mercy Hospital-Soniat Memorial, but besides these there are the United States Marine Hospital, with 572 beds, the old French Hospital, which became famous during the yellow fever epidemic of 1905, and the Illinois Central Hospital, an industrial institution. Then there are numerous specialized hospitals, such as the De Paul Sanitarium for the Insane, the New Orleans Home for Incurables, the City Hospital for Mental Diseases, the Orleans Tuberculosis Hospital, the Ear, Eye, Nose and Throat Hospital, the New Orleans Hospital and Dispensary for Women and Children, and the New Orleans Convalescent Home.

Add to these the Flint-Goodridge Hospital of Dillard University, for colored, and the several specialized institutions attached to Charity Hospital and you have a general cross-section of New Orleans facilities.

Also situated in New Orleans are the College of Medicine of Tulane University and the Medical Center of Louisiana State University, with their famed libraries, and the library and journal of the Orleans Parish Medical Society, thus presenting medical opportunities as well-rounded as any in the South.

*Prepared for the SOUTHERN MEDICAL JOURNAL by the Publicity Department of the New Orleans Association of Commerce.

The excellent medical facilities of New Orleans are no accident, but a heritage taken from the traditions of the past, for no city owes more to medical science than does New Orleans. Medical science, combined with good engineering, is responsible for the civic regeneration which changed New Orleans from a colony in the miasmic marshes to a healthful, modern, sanitary city. Discovery of the causes, prevention and control of the great epidemic and endemic diseases gave New Orleans a better understanding of its problems. Institution of efficient sewerage, drainage and purification began the solution of them. Doctors labored tirelessly for victory over the predatory parasites of the microscopic world, and gained bloodless triumphs more significant than all the bloody battles of history.

Whenever new ideas in medical progress have appeared, the medical profession of New Orleans has either reflected that progress promptly, or has taken a leading part in its elucidation. The whole modern idea of insect-borne disease came from the city. The first convincing demonstration on a large scale in America of the eradication of yellow fever by mosquito control was made in New Orleans. The scientific literature in every modern language is replete with references to and descriptions of important contributions from New Orleans and New Orleans physicians to modern knowledge of hookworm, malaria, leprosy, beriberi, dysentery, yellow fever, pellagra, cholera, typhoid, and other plagues.

Fifty years ago malaria occurred during most of the year throughout the city, causing many deaths and much impairment of health and happiness. Installation of modern drainage eliminated much of the trouble, and today there is hardly enough malaria in New Orleans to teach medical students.

As late as thirty years ago, periodic yellow fever epidemics swept the city, taking a toll of thousands on thousands of lives and demoralizing business and other normal activity. Yellow fever was eliminated in New Orleans in 1905, never to return as long as our present civilization survives.

Twenty-five years ago, gastro-intestinal diseases were prevalent and typhoid, diarrhea and dysentery took their toll of thousands. But now, with the installation of an unexcelled water purification system, such diseases are negligible. A further contributing factor has been the improved sanitary conditions in the handling of food, especially milk, instituted by the State and city boards of health.

Thus in its long history, medicine and New Orleans have grown and progressed hand in hand, medicine aiding New Orleans to grow, and the city in turn contributing to medical progress.

The history of New Orleans' medical education, despite the city's age of 219 years, goes back little more than a century, to 1834. But the history of New Orleans' medicine is a story which begins shortly after the founding of the city in 1718.

The first medical men of New Orleans were the military physicians, with the rank of surgeon-major, sent to Bienville during the first decade of his administration as colonial governor.

Throughout the Eighteenth Century, the medical knowledge of the city came from France and the population, which was below 9,000 even in 1800, was served entirely by Creole physicians. In 1803, however, the Louisiana Territory was purchased by the youthful United States Government, and that transfer was the signal for the abolition of all restrictions which the colonial government had imposed. Navigation, agriculture, commerce and industry developed, and a period of wealth and prosperity began to develop. In this period of enlightenment, the French physicians and their Creole descendants organized the first boards of health, and the first medical societies and journals, drafted the first municipal regulations for sanitation, and made effective the first laws to regulate the practice of medicine.

And medical education and practice, despite the fact that New Orleans was now an American city, remained French. It was during this prosperous period that the Creole youth, and especially those interested in medicine, looked to Paris as the source of their inspiration and knowledge. Though native born, they were educated in the lycees, and went through a nine-year course of medical education.

But French supremacy was soon to be ended under the progressive new government. Soon the Americans, whom the Creoles studiously isolated themselves from, outnumbered the French, setting up a dual population personality which remained distinct until both were united by the common interests of the Civil War. And the Americans wanted treatment from American doctors.

Early medical education in the United States was of a low status. In 1803, there were only 5 medical schools in the country, and all were situated in the North and East. But tremendous expansions, which boosted New Orleans' population from 49,286 in 1830 to 102,191 in 1840 and affected the rest of the country likewise, created a demand for physicians and medical education. As the covered wagons of the pioneers labored toward the west and the newly opened territory of the Louisiana Purchase, between 1810 and 1840, twenty-six new medical colleges were founded, one of which opened in New Orleans in January, 1835.

The Medical College of Louisiana was founded by seven intrepid young American doctors in 1834, the oldest in the Southwest, the third south of the Potomac and Ohio Rivers, and fifteenth in the United States. On September 29, that year, there appeared in the advertising columns of *The Bee* a prospectus, in French and English, announcing the opening lecture to take place January 5. The lectures were to be in English. The faculty were seven young English-speaking physicians, only recently arrived in the city.

A furore arose, and the new college was the principal topic of conversation. Establishment of the college without authorization of the Legislature was criticized. "Self-appointment" of the faculty was considered distasteful. The youth of the professors was objected to. But the reason behind it all was the opposition of the Creole population and the old French population,

steeped as they were in European medical practices and Parisian education for their physicians.

But they soon saw that their arguments would be of no avail against the ardor and enthusiasm of Drs. Hunt, Harrison, Luzenberg, Mackie, Ingalls, Cenas and Barton, the youthful physicians. On January 5, as scheduled, the first lecture of a medical college without endowment and without domicile was delivered to eleven students and a few sympathetic friends.

The course was a two-year one with sessions of four months, with lectures delivered at the homes of the professors, at No. 41 Royal Street, and twice a week in the wards of the Charity Hospital. In April, the college was granted a charter by the Legislature. Later that month the first successful session ended.

The first graduation exercises took place a year later, when the degree of Doctor of Medicine was conferred on Messrs. Carpenter, Delatule, Delavigne, Fosgate, Hart, Kostki, Longstaff, Lawhon, Lewis, Romer and Traweek.

During the first ten years of its existence, the Medical College of Louisiana had a slow growth. Matriculation remained small, and graduates seldom exceeded ten in number. But in 1840, it acquired a home of its own in the vicinity of Charity Hospital, and the lectures were finally all held under one roof.

In 1845 the success and fame of the college led to the establishment of the University of Louisiana, with the medical college its medical department. In 1847 it moved into a new building, claimed to be the largest and best in the United States for teaching the medical art. By 1859 it ranked fifth among American medical colleges, and had a matriculation of 333 and 97 graduates. Many considered it the best medical college in the country, a high reputation which it has not lost to this day as the Medical College of Tulane University.

Its progress was halted, unfortunately, by the drums of the Civil War which called professors and students to battle, to fight side by side, and no one knows to what heights it would have risen but for the evils of Reconstruction. But the University reopened after the war and continued its teaching of the medical profession.

In 1884 the University of Louisiana was transferred to the Tulane University of Louisiana, and the medical department went with it, to become in 1913 the College of Medicine. In the 103 years of its existence, about 7,000 have been graduated with the medical degree, and the faculty has included some of the foremost men in medicine in its various branches in the country.

Until 1931, Tulane provided the only medical educational facilities in the city, and even staffed the Charity Hospital. A 1933 census showed that between 50 and 60 per cent of the physicians and surgeons in Louisiana were graduates of Tulane. But another great institution had entered the field of medical education in the South.

Louisiana State University established a new medical center at New Orleans near the Charity Hospital, and graduated its first class in June, 1934. Thus more medical education has been made available for the youth of the city and the South.

Book Reviews

Synopsis of Digestive Diseases. By John L. Kantor, Ph.D., M.D., Associate in Medicine, Columbia University; Gastroenterologist and Associate Roentgenologist, Montefiore Hospital for Chronic Diseases, New York. 302 pages, illustrated. St. Louis: The C. V. Mosby Company, 1937. Cloth $3.50.

John L. Kantor, than whom there is not a more finished gastroenterologist in the world, in his "Synopsis of Digestive Diseases," has correlated the essential knowledge of diagnosis and treatment of diseases of the stomach, intestines, liver and pancreas. His wide experience as a clinician and as a teacher in the College of Physicians and Surgeons, the medical department of Columbia university, has qualified him to write the best textbook on digestive diseases for medical students and for physicians that has been published. The book is to be commended particularly to general practitioners for concise, accurate and up-to-date data for ready reference in the diagnosis, dietary management and treatment of abdominal diseases.

Obstetrics for Nurses. By Joseph B. DeLee, A.M., M.D., Professor of Obstetrics and Gynecology, Emeritus, University of Chicago; Consultant in Obstetrics, Chicago Lying-in Hospital and Dispensary; Consultant in Obstetrics, Chicago Maternity Center, and Mabel C. Carmon, R.N., Chief Supervisor and Instructor in the Birthrooms, Chicago Lying-in Hospital and Dispensary. Eleventh Edition, Revised and Reset. 659 pages, illustrated. Philadelphia: W. B. Saunders Company, 1937. Cloth $3.00.

A practical textbook for the student nurse. The text is free from labored effort in the presentation of subject material and the many splendid illustrations add to its value as a book for class work. Very wisely, the author summarizes each chapter by appending a series of questions for student purposes. The references for collateral reading and study afford the pupil the opportunity to gain a broader viewpoint upon the subject in which she may have special interest. A well selected "glossary" completes a volume that presents a comprehensive course in obstetrics for nurses. This edition maintains the tradition of its author as a thorough and careful teacher.

Fischerisms: Being a Sheaf of Sundry and Divers Utterances Culled from the Lectures of Martin H. Fischer, Professor of Physiology in the University of Cincinnati. By Howard Fabing, a second and enlarged edition by Ray Marr. 47 pages. Springfield, Illinois: Charles C. Thomas, 1937.

An attractive diversion, a useful ornament for the table of the reception room. Its pithy laconicisms are amusing. It is evident that this well known physiologist resents modern dietary and culinary wrinkles. "Domestic science sours any stomach at once." "First needed reform of hospital management? That's easy, the death of all dietitians." "The 'light diet' of the average hospital is the polite term for starvation." "The practical man is one who practices the mistakes of his forefathers."

Operative Surgery: The Ear, Air Passages and Neck. By Martin Kirschner, Ordinarius Professor of Surgery and Director of the Surgical Clinic at the University of Tubingen (Germany). With the Collaboration of A. Lautenschlager and Dr. O. Kleinschmidt. Authorized Translation by I. S. Ravdin, B.S., M.D., Harrison Professor of Surgery, University of Pennsylvania; Surgeon, Hospital University of Pennsylvania, and George M. Coates, A.B., M.D., Professor of Otolaryngology, Medical School, Professor of Oto-Rhinology, Graduate School of Medicine, University of Pennsylvania; Surgeon, Graduate, University of Pennsylvania, Presbyterian and Abington Memorial Hospitals. 528 pages, illustrated. Philadelphia: J. B. Lippincott Company, 1937. Cloth $12.00.

This is a volume of surprisingly beautiful illustrations. Indeed they are so attractive as to become a real danger. They seem to make the most difficult operative procedures easy and safe. This is especially true in the section on neck surgery, for example, esophageal diverticula. The author uses sharp scissors for tonsillectomy and advises complete suture of the pillars with the short curved needles in every case. He illustrates the old-time tonsil guillotine of Physick, but seems unfamiliar with safer American method of the cold snare. It is most disappointing to note the use of the Beckman adenoid curette and no mention is made of the La Force and other safety basket instruments. He illustrates and advises the use of Marschik's tonsil hemostat, though it has long since been assigned a place in the museum of discarded tools in America.

The American translators have inserted many one and two line sentences parenthetically. Otherwise the student of the chapters on bronchoscopy and esophagoscopy would hardly have heard of Chevalier Jackson. This ignoring of American contributions by the German authors may be due to ignorance, to German provincialism or possibly a Nazi suspicion that Jackson was a Hebrew(?). The book has a fair index, is a beautiful work of genuine art, but weighs four and a half pounds. It seems amazing that authors with such extensive experience, occupying university positions could completely ignore contributions by French, English and American operators.

Tweedy's Practical Obstetrics. Revised and largely rewritten by Bethel Solomons, M.D., F.R.C.P.I., F.C.O.G., M.R.I.A., F.A.C.S. (Hon.) Gynecologist, Dr. Stevens' Hospital, Dublin, and Ninian McIntire Falkiner, M.D., Sc.D., F.R.C.P.I., F.C.O.G., Visiting Gynecologist, Royal City of Dublin Hospital. Seventh Edition. 773 pages, illustrated. New York: Oxford University Press, 1937. Cloth $8.75.

This volume maintains the well established reputation of its author. The simplicity and clarity of expression renders the text a valuable reference for the specialist and general practitioner. New thought in obstetric science has been generously supplied and time-honored obstetrical axioms have been amplified. The theme predominating is one of practicality for the clinician. The chapters on "abnormal labor" and "the infant" are splendid contributions to safe and progressive obstetric practice. Of especial interest are the comparative outlines of various conditions, for example: contraction and retraction rings, accidental hemorrhage and placenta previa. The treatise is excellent and useful.

Manual of the Diseases of the Eye. For Students and General Practitioners. By Charles H. May, M.D., Consulting Ophthalmologist to Bellevue, Mt. Sinai and French Hospitals, New York; Formerly Chief of Clinic and Instructor in Ophthalmology, Medical Department of Columbia University, and Director of the Eye Service at Bellevue Hospital, New York. Fifteenth Edition. Revised with the Assistance of Charles A. Perera, M.D., Instructor in Ophthalmology, College of Physicians and Surgeons, Medical Department of Columbia University, New York. 498 pages, illustrated. Baltimore: William Wood & Co., 1937. Cloth $4.00.

This handy volume of 500 pages has been popular with medical students and general practitioners for thirty-five years. It is concisely written, well illustrated, and has an excellent index. While it furnishes far more material than the average general practitioner can use, the volume is too sketchy and brief for the specialist. Nevertheless it will remain the best available text for students and those who desire a ready and dependable guide. Now that all interns are taught the use of the ophthalmoscope for routine physical examination, handy volumes like this have become of increasing use and value.

Child Labor and the Nation's Health. By S. Adolphus Knopf, M.D., New York University and Paris. 32 pages, illustrated. Boston: The Christopher Publishing House, 1937. Paper $.50.

This little booklet is a plea for the enactment of the child labor amendment on the basis of the improvement in the health of children that will result in their being kept from industry. The author places most of his emphasis on the fatigue and malnutrition that accompany child labor which are predisposing factors in causing the destructive type of tuberculosis during the adolescent period. He presents a plea for the establishment of a ministry of public health, for sterilization of the unfit and for more widespread dissemination of contraceptive procedures.

To Drink or Not to Drink. By Charles H. Durfee, Ph.D. 212 pages. New York: Longmans, Green & Co., 1937. Cloth $2.00.

The little book, entitled "To Drink or Not to Drink," by Charles H. Durfee, Ph.D., a psychologist, should be read by physicians who deal with "the problem drinker." It is an excellent discussion of a few of the psychological problems with which one has to deal in treating inebriates; but the author has missed an opportunity to stress the fact that ethyl alcohol, whether in beer, wine, whiskey or other alcoholic beverages, is a habit-forming narcotic, as harmful and as enslaving as morphine. A better title for the book would be "The Problem Drinker," because it outlines for the public, and the medical profession in particular, practical methods for the mental, moral and physical re-education necessary for the rehabilitation of unfortunates who have become alcohol habitues.

Brewers, distillers and bootleggers will agree heartily with Dr. Durfee when he advises parents to teach their children to drink moderately in the home. He says (page 185): "It seems to me wiser, if drink they insist on, that they taste their first glass of wine or beer, or their first cocktail, in the home. It is far better that

they should master there, rather than in a bar or road house, the technic of drinking in moderation—'like a gentleman.' It certainly seems poor psychology, and loose thinking, to believe and to advise that parents teach their children the moderate use of a habit-forming narcotic. Certainly the person who has never touched alcohol in any form is safe from forming a vicious habit.

Contrary to the brewery and distillery propaganda, which Dr. Durfee inadvertently includes in his book, that teaching total abstinence from alcoholic beverages in the home makes men and women drink; the fact is that the sons and daughters of moderate drinking fathers and mothers are the ones who are doing most of the drinking and they become habitues. The case is recalled of a wealthy man, who took two drinks a day for many years and died at the age of 80. Moderate drinking was the rule in the home and wines were served with the evening meal. This moderate drinker's only son killed himself drinking before he was 35 years of age.

It would have been better if Dr. Durfee had confined his book to a study of the psychology of inebriety. His discussion of the prevention of alcoholism convicts the author of courting popularity, when he should have presented to his readers the known scientific facts regarding the chemistry, the physiological and psychological effects of ethyl alcohol and the pathology which it causes. There would be no alcohol problem if it were not profitable to manufacture, sell and advertise beer, wine, whiskey and other alcoholic beverages.

Treatment by Diet. By Clifford J. Barborka, B.S., M.S., M.D., D.Sc., F.A.C.P., Department of Medicine, Northwestern University Medical School, Chicago; Formerly Consulting Physician, The Mayo Clinic. Third Edition. 642 pages, illustrated. Philadelphia: J. B. Lippincott Company, 1937. Cloth $5.00.

"Treatment by Diet" is one of the most practical volumes on the dietary management of diseases that has been published. The fact that two editions have been exhausted proves that the medical profession appreciates its merit. The author, in making revisions for the third edition, has added a discussion on protamine zinc insulin in the treatment of diabetes; and additional data regarding the clinical aspects of vitamins have been included. Indeed his discussion on the relation of vitamins to disease and the uses of vitamins in the management of deficiency disorders, gives the general practitioner practical suggestions that will be helpful in the management of many nutritional disturbances. The diets prepared for the management of diabetes are orthodox and practical. Barborka's fourth edition of "Treatment by Diet" will have more to say about the high carbohydrate-low fat diets in diabetes because clinicians generally, following the lead of Geyelin, Sansum, Aldesburg and Porges and Rabinowitch, enjoy giving hungry diabetics adequate palatable food with less insulin than they used with the old high fat-low carbohydrate diets. Perhaps also the author may include in the fourth edition of his book diets for hyperinsulinism, a definite disease entity, the antithesis of diabetes mellitus. The fact that Lippincott publishes a book is assurance that it is beautifully printed and handsomely bound.

Diseases of the New Born. By Abraham Tow, M.D., Adjunct Professor of Pediatrics, New York Polyclinic Hospital and Postgraduate Medical School; Assistant Adjunct Pediatrician of the Abraham Jacobi Division for Children of the Lenox Hill Hospital; Fellow American Academy of Pediatrics; Fellow in Pediatrics, New York Academy of Medicine. 477 pages, illustrated. New York: Oxford University Press, 1937.

This work should be of great value to pediatricians, obstetricians, and those general practitioners who include obstetrics and the care of the new born in their work. The author has had a large experience in the care of newly born infants, which experience is largely drawn upon in many case reports and illustrations. In addition the rather voluminous literature which has grown up around this period of life is well organized and presented in a concise and readable form. The author does not hesitate to express his personal opinion on some controversial subjects, as, for instance, the treatment of intracranial hemorrhage. These opinions, however, are logical and are in agreement with those of the majority of pediatricians. The first chapter on general considerations is especially good, inasmuch as it describes in detail the profound changes which take place in the first few weeks after birth. At the end of each chapter is an up-to-date bibliography and the table of contents and index make for easy reference to small items in the text.

Safe Childbirth: The Three Essentials. By Kathleen Olga Vaughan, M. B. (Lond.), Formerly Medical Officer, Egyptian Quarantine; Hon. Inspector, Dufferin Hospitals, India; Superintendent, Dufferin Hospitals, Calcutta; and Sometime Superintendent, Diamond Jubilee Zenana Hospital, Kashmir. With Foreword by Howard A. Kelly, M.D., LL.D., Professor Emeritus of Gynecological Surgery, Johns Hopkins University, Baltimore. 154 pages, illustrated. Baltimore: William Wood & Co., 1937. Cloth $3.00.

According to the author, the three essentials of safe childbirth for the mother and the infant are: (1) the round pelvis, (2) mobile pelvic joints, and (3) the use of the natural posture during labor and delivery. These essentials are almost always found in primitive peoples, where the girls grow up out of doors and where the women continue to be active after reaching adult life. There, childbirth is easy and maternal fatalities extremely rare. The author believes that the increasing difficulty and danger attending parturition among the more civilized peoples are due to the absence of those essentials. At an early age, when the pelvis is still in a formative stage, the child is forced to sit for long periods at schools and at home, and so the round contour of the pelvis and the flexibility of the joints is lost. The fact that the squatting position is no longer used for defecation deprives the pelvis of that daily exercise and so increases the pelvic rigidity. The author states that at delivery the woman is prevented from assuming the natural squatting or kneeling position and so the mechanical advantages of that position are lost. At the same time, the danger of sepsis is increased because the amniotic fluid and blood cannot drain directly away.

In regard to the position of the woman during delivery, no doubt all obstetricians in their own experience have had occasion to learn that a woman who is allowed to follow her instincts does not assume the lithotomy nor the lateral position. The use of these positions, by physicians today, increases the convenience for the

attendant, it makes surgical sterilization of the field more practical, and it makes it possible to watch and to protect the perineum, but there can be little disagreement with the author's contention that the squatting position is more nearly correct mechanically. She believes that the disadvantages of the natural position can be overcome by familiarizing the patient and the physician with the technic of its use.

Because of the nature of the problem, scientific proof of the author's tenets, in the form of reports of experimental work or statistics, is difficult to produce. However, she has written an extremely interesting and stimulating book.

Diets and Recipes. By E. P. Poulton, M.A., D.M. (Oxon.), F.R.C.P. (Lond.), Physician to Guy's Hospital, and Mary D. Hawkey. 105 pages, diet tables, 211 recipes and 21 specimen diets. New York: Oxford University Press, 1937. Paper, $.50.

This is one hundred and five pages of concentrated information on food values, menus and recipes, which are particularly adaptable for the use of the physician and nurse, as well as the hospital and home use.

It is particularly helpful in that the tables show isocalorie equivalents, making it a simple matter to calculate food values in the diet, particularly in respect to the various food element ratios.

Diets and Recipes and the Treatment of Diabetes and Obesity. By E. P. Poulton, M.A., D.M. (Oxon), F.R.C.P. (Lond.), Physician to Guy's Hospital. 121 pages. New York: Oxford University Press, 1937. Cloth $2.75.

This book takes up in a very practical way the dietary management of diabetes and obesity, the two outstanding disorders which are managed mainly by diet. The various complications of these two disorders are, also, thoroughly discussed. In addition to tables on food values, specimen menus and recipes, up-to-date information is given on the accessory food elements and minerals.

This is a well worth-while book for physician, nurse and patient.

The Control of Tuberculosis in England Past and Present. By G. Gregory Kayne, M.D., M.R.C.P. (Lond.) D.P.H., Deputy Medical Superintendent, County Sanatorium, Clare Hall, Middlesex. With a foreword by Sir Humphry Rolleston, Bart.G.C.V.O., K.C.B. 188 pages. New York: Oxford University Press, 1937. Cloth $3.00.

The first and second parts of this book present a brief history of the methods of notification, prevention and treatment of tuberculosis and the provision for care of tuberculous patients in England. As such it is not easy reading. A great many dates and figures scattered more or less at random through the text make it confusing and difficult. It is just possible that the author was forced to condense his manuscript to such a point that he lost the fullness and cadence that make readable history. There are many excerpts from papers by earlier authors which are in the main interesting. Certain parts stand out, such as the quotation from Robert Philip which advances the idea of tuberculosis dispensaries and gives rules for their organization, and the author's discussion of the National Insurance Act promoted by Mr. Lloyd-George and passed in 1912.

The third part of the book is named "The Problem of Tuberculosis Today." In one subdivision of this he presents some mortality statistics, but with very little discussion as to their implication. In another he discusses recent advances in knowledge of tuberculosis, which will serve as a reminder to a student already conversant with the facts, but will not serve as a source for one seeking this knowledge. In a third division he discusses various schemes for meeting the problem of tuberculosis. This is the best part of the book and in it the author shows the effects of much experience and understanding. His discussion of the general practitioner is particularly good.

This book will probably be of more interest to English physicians who are familiar with the names and places, but it cannot be recommended to Americans. Those who do read it will undoubtedly be impressed with the evidence of active and positive participation of the government in medical care, but again the evidence given is not sufficient to aid in formulating opinions.

Chronic Miliary Tuberculosis. By Clifford Hoyle, M.D., M.R.C.P., Assistant Physician to the Hospital for Consumption and Diseases of the Chest, Brompton and Michael Vaizey, M.B., M.R.C.P., Medical First Assistant and Registrar, London Hospital. 140 pages, illustrated. New York: Oxford University Press, 1937. Cloth $4.25.

The authors have expanded into book form and described as a clinical entity the records of ten cases of their own and one hundred ten selected from the literature. The first inclination of the reviewer when confronted with the above was to suspect a red herring to lead him astray from the true pathway of tuberculosis. However, after reading this excellent little monograph, he felt that the authors had made a real contribution to the knowledge of the disease. The ten cases of their own series were most rigidly selected, admitting no doubt as to their diagnosis and presenting a text-book picture that may lead to the discovery of many more cases. In addition they present a wealth of material for studying the hematogenous spread of tuberculosis. They have analyzed the total group of one hundred twenty cases in an effort to establish the clinical features of chronic miliary tuberculosis. They are confronted with a marked variability and the conclusion that the cases show different degrees of virulence or pace seems evident. The suggestion that some of the cases may be due to a bovine tubercle bacillus seems particularly apt and warrants investigation. The fact that they demonstrated the retarded pace and sometimes arrest which may occur in miliary tuberculosis, I feel justifies the description of the entity.

In the discussion of the cases their effort to fit them into some of the theories of hematogenous spread of tuberculosis may be confusing unless carefully read. Their *Case 1*, showing lymphogenous spread in the lungs and associated endarteritis of the pulmonary arteries (photomicrographs are included), is undoubtedly the most interesting and unusual of the series and the authors repeatedly refer to it as if it were a favorite child. The endarteritis and the course of the disease ending in heart failure suggest that they may have cast a tiny ray of light into the etiologic haze surrounding so-

called Ayerza's disease. The one hundred ten cases selected from the literature have been cleverly abstracted and are included in an appendix.

This book is heartily recommended to the student of tuberculosis as a source of interesting material thoughtfully analyzed and presented with unusual restraint.

Cancer and Diet with Facts and Observations on Related Subjects. By Frederick L. Hoffman, LL.D., the Biochemical Research Foundation of the Franklin Institute, Philadelphia. 767 pages. Baltimore: The Williams & Wilkins Company, 1937. Cloth $5.00.

Here is an exhaustive survey of the relationship of food to cancer. Dr. Hoffman, in his first pages, cites a large number of observations that have been made by various writers from about 1200 to 1935 and comes to the conclusion that the results obtained were very contradictory. He discusses the modern diet, including such factors as the changed method of preparation and sources of supply. He feels that there is an actual increase in cancer. Other writers do not believe that this is so. They think that there is a cancer rate for each decade of life which increases as the length of the individual's life increases; that as more people now live to an older age there are more people liable to cancer, but the proportion for each decade remains the same. The third section of the text deals with the influence of the various food factors on cancer metabolism. The fourth section is devoted to statistical studies of questionnaires. These questionnaires and instructions to the research assistants who collected them are given in full in the appendix.

From his collected data the writer has drawn this conclusion: that overnutrition is common in cancer patients to a remarkable and exceptional degree, and that overabundant food consumption unquestionably is the underlying cause of the root condition of cancer in modern life. In view of recent research in which a carcinogenic factor was found in wheat germ oil, foods should again be scrutinized as possible causes. There has been a great amount of effort put in this volume and it should encourage students of oncology to make further studies in this field.

Southern Medical News

THE OKLAHOMA CITY CLINICAL SOCIETY

The Oklahoma City Clinical Society will hold its Eighth Annual Fall Clinical Conference at the Biltmore Hotel, Oklahoma City, November 1-4. This postgraduate medical assembly will again offer another series of intensive clinics and lectures to the profession of the Southwest, covering the most important fields of medicine, sugery and the specialties. In addition to the sixteen distinguished guest lecturers the program includes seventy-two lecturers chosen from local members of the Society, all of whom have teaching ability and practical experience in their particular subjects. This complete four-day course has been arranged at a most nominal expenditure of time and money for those who attend. The list of guest speakers along with an announcement of the meeting may be found on page 36 of this issue of the JOURNAL.

ALABAMA

The Southeastern Branch, American Urological Association, will meet in Birmingham November 5 and 6.

Dr. Seale Harris, Jr., Birmingham, has been made Second Vice-President of the Chattahoochee Valley Medical Association.

Dr. Elihu F. Sloan, Shannon, has been made Health Officer of Shelby County to succeed Dr. Hugh C. Nickson, resigned.

Dr. Thomas M. Towns, Clarence, has been made Health Officer of Blount County to succeed Dr. Samuel D. Sturkie, Oneonta.

Dr. Albert S. Dix, Mobile, has been made Health Officer of Jackson County to succeed Dr. George E. Newton, who has been made Health Officer of Lauderdale County.

Dr. Herbert A. McClure, Double Springs, has been made Health Officer of Choctaw County.

Dr. Thomas T. Box, Double Springs, has been made Health Officer of Winston County.

Dr. George E. Maddison has been made Health Officer of Monroe County to succeed Dr. Martle F. Parker, resigned.

Dr. Louis Holtz, formerly of Fargo, Georgia, has moved to Ashland.

Dr. John Morgan Clack, formerly of Rockwood, Tennessee, has moved to Fairfax.

Dr. Randolph Nelson Long and Miss Irma Carter Fowlkes, both of Selma, were married April 15.

DEATHS

Dr. Erastus Hardy Tubb, Cordova, aged 56, died recently of cholecystitis and stone in the common duct.

Dr. Jesse Morton Barfield, Lineville, aged 57, died June 4 of cerebral hemorrhage.

Dr. Thomas Jefferson Brothers, Anniston, aged 58, died September 1 from a heart attack.

Dr. Robert Emory Peebles, Birmingham, aged 52, died August 24 from a heart attack.

ARKANSAS

The State Medical Board of the Arkansas Medical Society has elected the following officers for the coming year: Dr. William A. Snodgrass, Little Rock, President; Dr. Lorenzo T. Evans, Batesville, Vice-President; Dr. Leonce J. Kosminsky, Texarkana, Secretary.

The Seventh Councilor District Medical Society has elected the following officers for the coming year: Dr. W. G. Hodges, Malvern, President; Dr. C. W. Jones, Benton, Vice-President; Dr. Thomas C. Watson, Benton, Secretary; Dr. C. K. Townsend, Arkadelphia, Treasurer.

Dr. John H. Wilson, Hamburg, has been made Resident Surgeon at Dyess Colony.

Dr. Robert A. Milliken, Little Rock, has been made Director of the Crippled Children's Division of the Department of Public Welfare.

Dr. Arthur M. Washburn, Little Rock, has been placed in charge of the Division of Communicable Disease Control of the State Department of Health.

Dr. Doyle W. Fulmer, Benton, has been placed in charge of the Division of Malaria Control of the State Department of Health.

Dr. Pierre Redman, Mena, has been made Superintendent of the Mena Hospital.

Dr. L. H. McDaniel, Tyronza, was recently made Commander of the American Legion, Fifth District.

Dr. Harvey S. Thatcher, Little Rock, was recently certified by the American Board of Pathology.

Dr. Charles T. Chamberlain, Fort Smith, has been elected to Associate Fellowship in the American College of Physicians.

Dr. John W. Redman, formerly of Charlotte, has moved to Fort Smith, where he is associated with Dr. Hugh Johnson.

Dr. L. L. Hubener, formely of Dyess, is now located at Blytheville.

Dr. W. T. Wilkins, Cotton Plant, has been made a Director of the Young Business Men's Club of that city.

Dr. John M. Smith, Morrilton, has been made a Director of the Junior Chamber of Commerce of that city.

Dr. W. A. Snodgrass, Jr., and Miss Mary Jane Moseley, both of Warren, were married August 7.

DEATHS

Dr. Charles Dake, Hot Springs National Park, aged 76, died June 12 of arteriosclerosis.

Dr. Wyatt Farmer Simpson, Hot Springs National Park, aged 54, died May 28.

Dr. John Elijah Underwood, Waveland, aged 72, died June 1.

Dr. Meyer Joseph Epstein, Jonesboro, aged 80, died June 17 of arteriosclerotic heart disease and acute pulmonary edema.

Dr. William Thomason, Olyphant, aged 73, died recently.

Dr. John E. McMahan, Conway, aged 77, died July 31.

Continued on page 34

Where Early Diagnosis is Imperative

LESS than thirty years ago the diagnosis of malignant disease in regions not readily accessible to visual or manual examination was practically restricted to its late, obvious stages. But today you are not in that helpless position. . . . Instead, you have at your command a dependable diagnostic medium—radiography.

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Since early diagnosis is the prime essential in the fight against cancer, the radiological specialist is your most important ally. His radiographs and observations can provide the earliest conclusive diagnostic information . . . determine the location, extent, and probable character of the new growth . . . furnish indications as to the most effective therapeutic measures. Eastman Kodak Co., *Medical Division*, Rochester, N. Y.

RADIOGRAPHS PROVIDE DIAGNOSTIC FACTS

Continued from page 1042

DISTRICT OF COLUMBIA

The Washington Medical and Surgical Society has elected the following officers for the coming year: Dr. Joseph Horgan, President; Dr. Robert Oden, Vice-President; Dr. Beveridge Miller, Secretary; Dr. Frank E. Gibson, Permanent Treasurer.

The Aesculapian Society has elected the following officers for the coming year: Dr. Raymond C. Kirchner, President; Dr. Frank R. Shea, Secretary-Treasurer.

Dr. Charles P. Ryland, formerly of Binghamton, New York, has moved to Washington.

Dr. William H. Walcott, formerly of Chatham, Virginia, has moved to Washington, where he has accepted a position on the staff of the United States Public Health Service.

Dr. Sara E. Branham, Senior Bacteriologist, United States Public Health Service, was given the honorary degree of Doctor of Science by the University of Colorado.

FLORIDA

The Florida Society of Dermatology and Syphilology has elected the following officers for the coming year: Dr. Chadbourne A. Andrews, Tampa, President; Dr. Lauren M. Sompayrac, Jacksonville, Secretary.

Dr. L. Y. Dyrenforth, Jacksonville, has been elected to Associateship in the American College of Physicians.

Dr. J. C. Pate, Tampa, has been made a Fellow in the International College of Surgeons.

Dr. Robert H. Farringer, Hollywood, is taking special work in otolaryngology in Vienna.

Dr. A. L. Huskey, Chattahoochee, has been taking work in insulin shock therapy in Elgin, Illinois.

Dr. E. W. Bitzer, Tampa, has been taking postgraduate work in Vienna.

Dr. G. C. Bottari, Tampa, has been attending clinics in Germany and France.

Dr. A. R. Beyer, Tampa, is taking postgraduate work in Vienna.

Dr. O. C. Brown, Fort Lauderdale, is visiting clinics in Chicago.

Dr. Will L. Wood, Mount Dora, is taking postgraduate work in Chicago.

Dr. J. C. Pate, Tampa, is visiting clinics in the East.

Dr. A. O. Morton and Dr. J. E. Harris, Sarasota, have been taking postgraduate work in Vienna.

Dr. J. B. O'Connor has joined the staff of the Florida State Hospital, Chattahoochee.

Dr. Albert W. Lewis, formerly of St. Augustine, has moved to Atlanta, Georgia.

Dr. Fortunat A. Troie, formerly of Miami, has moved to New Orleans, Louisiana.

Dr. L. C. Ingram, Orlando, announces the association of his son, Dr. Hollis C. Ingram, in the practice of ophthalmology and otolaryngology.

Dr. V. M. Johnson, West Palm Beach, and Miss Lois McCartney were married June 1.

Dr. D. Paul Bird, Lakeland, and Miss Mildred Elaine Lewis were married April 17.

Dr. Carl S. Lytle, Dunnellon, and Miss Carolyn Endlsey were married recently.

Dr. Clayton Alton Adams, Jr., Trenton, and Miss Marie Lang were married May 30.

DEATHS

Dr. S. A. Hawkins, Clermont, aged 82, died July 22.

GEORGIA

The Georgia Pediatric Society will hold its regular scientific meeting in Atlanta, December 9, with the following guest speakers: Dr. Ralph S. Muckenfuss, New York; Dr. Priscilla White, Boston, Massachusetts; and Dr. Joseph Brennemann, Chicago, Illinois.

Dr. James J. Clarke, Atlanta, has been made President of the Chattahoochee Valley Medical Association and Dr. Frank K. Boland, Atlanta, has been made Secretary-Treasurer.

Dr. J. Weyman Davis, Athens, has been made a Fellow in the American College of Surgeons.

Dr. S. M. Withers, Jr., formerly of Atlanta, has been made Medical Supervisor of the Callaway Mills, LaGrange.

Dr. Schley Gatewood, formerly of Columbus, has moved to

Continued on page 36

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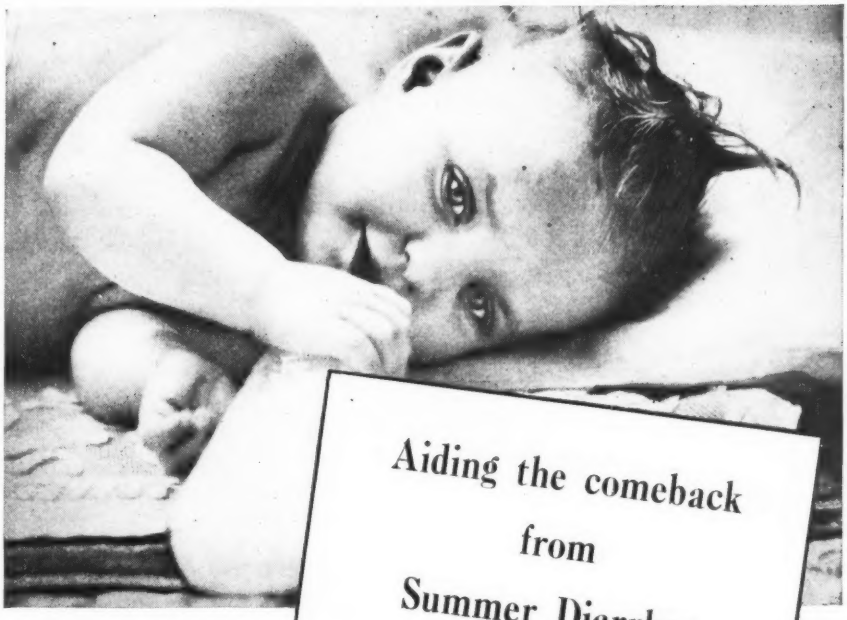

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Continued from page 34

Cuthbert, where he has been appointed to the Medical Staff of the Patterson Hospital.

Dr. Thomas Oscar Vinson, Macon, has been made Health Officer of Spalding County.

Dr. W. C. Humphries, formerly of Griffin, has moved to Acworth.

Dr. W. F. Reavis, Waycross, has been made Vice-President of the Atlantic Coast Line Railroad Association.

Dr. G. A. Duncan, Decatur, is taking postgraduate work in New York.

Dr. E. F. Fincher, Atlanta, announces the association of Dr. Exum Walker for the practice of neurological surgery.

Dr. John I. Hall, Dr. C. N. Wasden and Dr. A. M. Phillips, Macon, announce their association for the practice of orthopedic sugery, general surgery and proctology.

Dr. Arthur G. Fort and Dr. Lester A. Brown, Atlanta, announce their association for the practice of ophthalmology and otolaryngology.

Dr. William B. Quillian, formerly of Atlanta, has moved to Cartersville.

Dr. Louis Holtz, formerly of Fargo, has moved to Ashland, Alabama.

Dr. R. A. Bartholomew and Dr. E. D. Colvin, Atlanta, have moved their offices from Ponce de Leon Avenue to Clifton Road, Northeast.

Dr. Charles M. McGill, formerly of New Orleans, has moved to Savannah.

Dr. Jarrett William Palmer and Miss Marie Peterson, both of Ailey, were married June 22.

DEATHS

Dr. James T. Elder, Farmington, aged 75, died June 7 of bronchopneumonia.

Dr. W. Z. Faust, Lexington, aged 83, died July 13.

Dr. Stephen Benjamin Malone, Sandersville, aged 59, died June 25 of apoplexy.

KENTUCKY

Dr. George McLean Lawson, formerly Professor of Public Health and Bacteriology at the University of Louisville School of Medicine, has been made Professor of Preventive Medicine and Bacteriology at the University of Virginia Department of Medicine, Charlottesville.

DEATHS

Dr. Thomas Jackson Davis, La Center, aged 71, died June 7 of carcinoma of the colon.

Dr. John C. Graham, Trinity, aged 69, died June 2 of cerebral hemorrhage.

Dr. Ewing W. Miracle, Loyall, aged 64, died June 19.

Dr. Samuel P. Oldham, Owensboro, aged 63, died June 17.

Dr. Archibald Henry Barkley, Lexington, aged 64, died June 1 of angina pectoris.

LOUISIANA

The Louisiana Society for Mental Hygiene has elected the following officers for the coming year: Dr. Joseph A. O'Hara, New Orleans, President; Dr. Paul C. Young, Baton Rouge, Executive Secretary.

Dr. Walter E. Levy, formerly Assistant Professor of Clinical Obstetrics, Tulane University of Louisiana School of Medicine, and Professor of Obstetrics in the Graduate School, has been made Professor and Head of the Department of Obstetrics at the Louisiana State University Graduate School of Medicine, New Orleans.

Dr. Robert W. Walton, formerly Assistant Professor of Pharmacology, Tulane University of Louisiana School of Medicine, New Orleans, has been made Professor and Head of the Department of Pharmacology at the University of Mississippi School of Medicine.

Continued on page 38

DOCTOR! YOU ARE INVITED TO ATTEND

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DR. WILLIAM L. BENEDICT, Ophthalmology, Rochester, Prof. of Opth., the Mayo Foundation, Univ. of Minn. Med. Sch.

DR. WILLIAM BOYD, Pathology, Winnipeg, Prof. of Pathology, Univ. of Manitoba; Pathologist, Winnipeg. Gen. Hosp.

DR. C. E. BURFORD, Urology, St. Louis, Prof. of Urology and has the Chair of Urology, St. Louis Univ. Med. Sch.

DR. FREDERICK CHRISTOPHER, Surgery, Evanston, Assoc. Prof. of Surg., Northwestern Univ. Med. Sch.; Chief Surg. of Evanston Hosp.

DR. H. EARLE CONWELL, Orthopedics, Birmingham, Attending Orthopedic Surg., St. Vincent's Hosp., South Highland's Infirmary, Children's Hosp., Crippled Children's Clinic, Hillman Hosp., Birmingham.

DR. WALTER DANNREUTHER, Gynecology, New York, Prof. of Gyn. and Dir. of the Dept., N. Y. Post-Graduate Med. Sch. and Hosp., Columbia Univ.

DR. CLAUDE F. DIXON, Surgery, Rochester, Assoc. Prof. of Surg., Univ. of Minn., Graduate Sch. (Mayo Foundation).

DR. CHEVALIER L. JACKSON, Bronchoscopy and Esophagoscopy, Philadelphia, Prof. of Clin. Bronchoscopy and Esophagoscopy, Temple Univ. Sch. of Med., and Hosp.

DR. SAMUEL A. LEVINE, Cardiology, Boston, Assistant Prof. of Med., Harvard Med. Sch.; Senior Assoc. in Med., Peter Bent Brigham Hosp., Boston; Consultant in Cardiology, Newton Hosp., Newton, Mass.

DR. E. PERRY McCULLAGH, Endocrinology, Cleveland, Assoc. Prof. of Med. in Charge of Endocrinology-Frank E. Bunts Lectures; Head of Section of Endocrinology and Metab., Cleveland Clinic, Cleveland.

DR. NORMAN F. MILLER, Obs. and Gyn., Ann Arbor, Prof. and Head of Dept. of Obs. and Gyn., Univ. of Mich.

DR. BERNARD H. NICHOLS, Roentgenology, Cleveland, Head of Section of Roentgenology, Cleveland Clinic, Cleveland.

DR. CYRUS C. STURGIS, Internal Med., Ann Arbor, Prof. of Med., Director Thomas Henry Simpson Memorial Institute for Medical Research; Director Dept. of Internal Med., Univ. of Mich.

DR. J. H. J. UPHAM, Internal Med., Columbus, Ohio, Dean of College of Med., and Prof. of Med., Ohio State Univ. College of Med., Columbus; President American Medical Assn.

DR. FRED W. WEIDMAN, Dermatology, Philadelphia, Prof. of Dermatological Research, Prof. of Dermatology and Vice-Dean in Dermatology and Syphilology, Graduate Sch. of Med.

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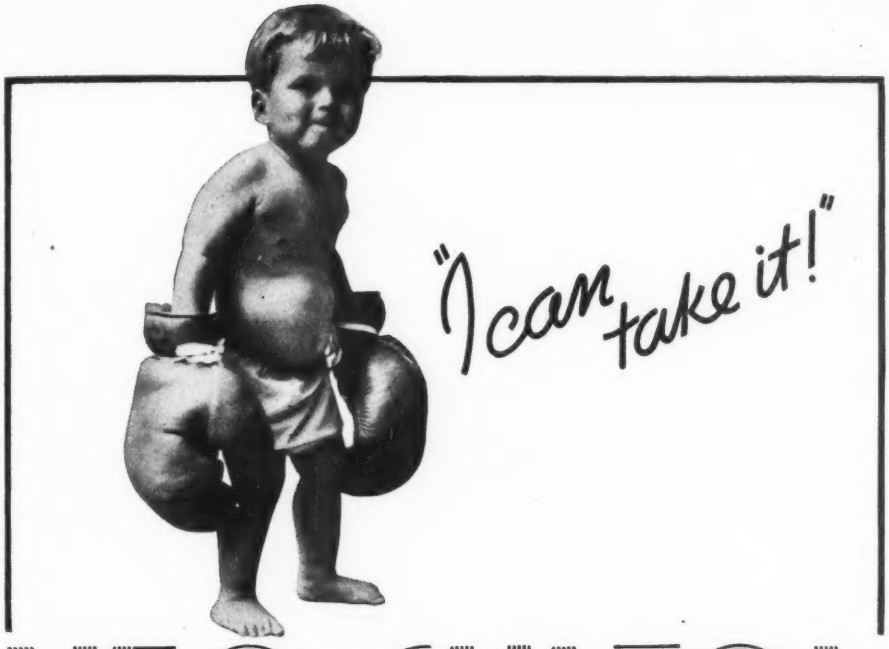

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LOUISVILLE, KENTUCKY

Continued from page 36

Dr. Earl C. Smith, New Orleans, has been taking postgraduate work in Chicago.

Dr. Fortunat A. Troie, formerly of Miami Beach, Florida, has moved to New Orleans.

Dr. Charles M. McGill, formerly of New Orleans, has moved to Savannah, Georgia.

Dr. Joseph William Wells, New Orleans, and Miss Sara Alice Simmons were married June 6.

DEATHS

Dr. Albert Peyton Lowe, New Orleans, aged 77, died June 24 of myocarditis, angina pectoris and arteriosclerosis.

MARYLAND

Dr. George A. Johns, formerly of St. Louis, Missouri, has been made Superintendent of the Rosewood State Training School, Owings Mills.

Dr. Abel Wolman, Baltimore, has been made Professor of Sanitary Engineering at Johns Hopkins University.

Dr. Maurice Sullivan, Baltimore, has opened offices on East Eager Street.

Dr. P. G. Hamlin, formerly of Newport News, Virginia, has moved to Crownsville.

DEATHS

Dr. John Jonas Kerr, Baltimore, aged 55, died June 9 of coronary thrombosis.

Dr. Maurice D. Kefauver, Smithsburg, aged 57, died June 19 of carcinoma of the kidney.

Dr. James R. Phillips, Preston, aged 92, died June 18.

Dr. Julius Joseph Leyko, Baltimore, aged 33, died June 8 of an accidental overdose of sodium amytal.

Dr. Charles W. Whaland, Chestertown, aged 87, died recently.

Dr. Charles Benjamin Ziegler, Baltimore, aged 81, died May 5.

MISSISSIPPI

Dr. G. M. Mast has been made Chairman of the Mississippi National Health Committee of the United States Junior Chamber of Commerce.

Dr. William R. Bethea, formerly of Memphis, Tennessee, has moved to Jackson.

Dr. W. B. Buckner, formerly of Jackson, has moved to Moss Point.

Dr. Jesse R. Hightower, Itta Bena, and Miss Frances Heidler were married July 2.

DEATHS

Dr. Thomas Enoch Steen, Florence, aged 65, died May 2 of epithelioma of the mouth.

Dr. John B. Huff, Taylorsville, aged 71, died in June.

Dr. E. H. DeBerry, Hazlehurst, aged 65, died July 18.

Dr. L. O. Carruth, Chesterville, died August 28.

Dr. J. M. Goodman, Cornerstone, aged 69, died August 21.

MISSOURI

Dr. Clifton Smith, St. Joseph, has been made Superintendent of the St. Louis Training School to succeed Dr. George A. Johns, resigned.

Dr. R. H. Runde, Mount Vernon, has been made Superintendent of the Missouri State Sanatorium.

Dr. George A. Johns, formerly of St. Louis, has moved to Owings Mills, Maryland, where he has been made Superintendent of the Rosewood State Training School.

DEATHS

Dr. William Preston Patterson, Springfield, aged 75, died June 7.

Dr. William A. Swope, Wheeling, aged 76, died May 24 of heart disease.

Dr. Ernest Guthrie Mark, Kansas City, aged 59, died June 7.

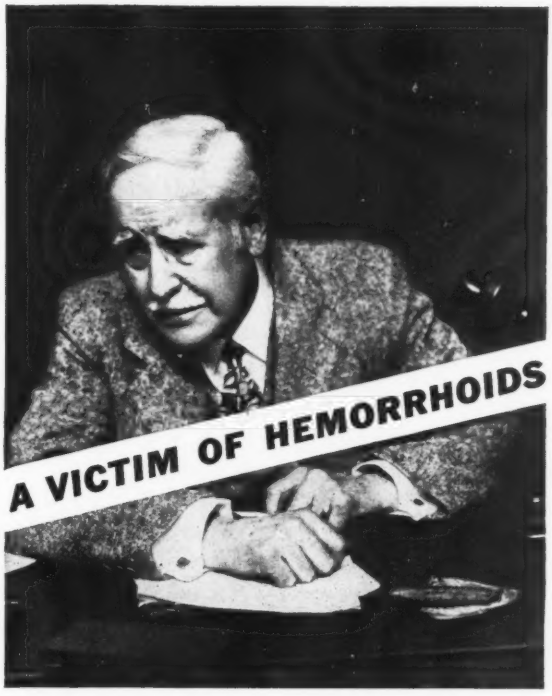
Dr. Reinhold Willman, St. Joseph, aged 81, died June 14 of chronic myocarditis.

Dr. James I. Anderson, Warrensburg, aged 77, died June 14 following a paralytic stroke.

NORTH CAROLINA

Dr. William de B. MacNider, Kenan Research Professor of Pharmacology at the University of North Carolina School of

Continued on page 40



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Oxygen Says:

"During the past few years I have become an increasingly important factor to the Medical Profession. I am now being used pre-operatively, post-operatively, in pneumonia, asthma, chronic heart conditions, etc. BUT, to do my best work therapeutically, I must be administered immediately following diagnosis, and continued until I have completed my task."

One of the most effective means for the administration of Oxygen in prolonged cases is the Nasal Catheter method—used and recommended by Doctors who have made a study of the value of Oxygen therapy.

Our PURITAN NASAL CATHETER OUTFIT, as shown, is efficient, economical, portable, and durable. We have installed this equipment in many of the leading hospitals over the entire country. We call your particular attention to the pressure-reducing regulator with which this unit is equipped, which is of the highest quality. A high-pressure gauge shows contents of cylinder, and an accurate working-pressure gauge registers flow in litres per minute, with positive control.

Puritan Nasal Catheter Outfits - Leading Makes of Oxygen Tents - Bedside Inhalation Units. For Sale or Rental at All of Our Locations.
All Types of Anesthetic Gas Machines, Resuscitators and Inhalators - Wilson Soda Lime.

Puritan Compressed Gas Corp.

BALTIMORE CHICAGO DETROIT CINCINNATI PHILADELPHIA
CAMBRIDGE ST. LOUIS ST. PAUL NEW YORK KANSAS CITY

Continued from page 38

Medicine, Chapel Hill, was recently made Dean of the School, succeeding Dr. Charles S. Mangum.

Dr. T. V. Goode, Statesville, has been made local Surgeon for the Southern Railway.

Dr. Z. L. Lewis, Plymouth, has been made District Health Physician for Tyrell, Hyde and Washington Counties.

Dr. A. R. Shands, Jr., Durham, has been made Medical Director of the Nemours Foundation for Crippled Children.

Dr. J. L. Pressly, Statesville, has been made a member of the Staff of the H. F. Long Hospital.

Dr. Joseph W. Beard, formerly of New York, has been made Assistant Professor of Surgery at Duke University School of Medicine, Durham.

Dr. Walter L. Thomas, Jr., formerly of Lynchburg, Virginia, has been made Assistant Professor of Obstetrics and Gynecology at Duke University School of Medicine, Durham.

Dr. Augustus S. Rose, formerly Associate Professor of Anatomy, University of North Carolina School of Medicine, Chapel Hill, has been made Assistant in Neurology at Massachusetts General Hospital, Boston.

Dr. William A. Graham, formerly of Edenton, has moved to Durham.

Dr. Evan W. McChesney, formerly of Chapel Hill, has moved to Dallas, Texas.

Dr. Davis Lee Moore, Stokes, and Miss Vandervoort Tatum were married July 9.

Dr. Jacob Harrison Shuford, Hickory, and Miss Robin Fraley were married June 25.

Dr. Maurice L. LeBauer and Miss Carolyn Weill, both of Greensboro, were married June 19.

Dr. Marion Timothy Plyler, Jr., Raleigh, and Miss Alma Odell Blanchard were married July 31.

Dr. Neill Henry McLeod and Miss Sara Leinster, both of Raleigh, were married June 26.

Dr. Archie Lipe Barringer and Miss Mary Evans Foil, both of Mount Pleasant, were married June 1.

Dr. Chivous Yulan Washburn, Shelby, and Miss Lillian Logan were married recently.

Deaths

Dr. C. A. Boseman, Pinehurst, aged 43, died recently.

Continued on page 42

ALKALINIZATION

by the safe, physiological process

WHERE buffered alkalinization is desirable—as during sulfanilamide administration, in the treatment of colds, influenza and other seasonal respiratory affections—Kalak offers these clinical advantages:

(1) It presents a balanced combination of bicarbonates in solution. (2) It contains the mineral substances normal to the blood (and no other).

Kalak's high buffering value helps to maintain the urinary pH of 7.4 which has been found so desirable in sulfanilamide therapy.

KALAK
is synthetically prepared—is hypertonic, uniform in composition, definite in alkali potency.

KALAK WATER COMPANY OF NEW YORK, INC., 6 CHURCH STREET, NEW YORK CITY

Startling Developments in Specific Therapy of BACTERIAL INFECTIONS

RARELY has such intense and general interest been displayed in a new medical discovery as in the chemotherapy of bacterial infections with Prontosil and Prontylin. This is attested by the constantly increasing number of published reports and the frequent discussions at medical meetings.

Streptococcus Infections—The advent of Prontosil and Prontylin has effected a radical change in the treatment of hemolytic streptococcus infections, especially puerperal septicemia, peritonitis, erysipelas, meningitis, scarlet fever, mastoiditis and septic sore throat. Even in serious cases, the acute symptoms rapidly subside, blood cultures become negative, and complications are less frequent. Prontosil and Prontylin have also proved effective in meningococcus meningitis.

Gonococcus Infections—Strikingly favorable results are being reported in gonorrhea, including acute, subacute and chronic anterior and posterior urethritis, inguinal adenitis, seminal vesiculitis, epididymitis and prostatitis. The response to this effective chemotherapy is manifested by the disappearance of urethral discharge and gonococci in less than a week and the prevention of extension. In gonorrheal urethritis and vulvovaginitis of children the results are highly satisfactory.

Urinary Infections—There is substantial clinical evidence that Prontylin in adequate doses has a specific action on the bacteria which commonly cause urinary infection, such as the colon, aerogenes and dysentery bacilli. Previous acidification of the urine appears unnecessary.

HOW SUPPLIED—Prontosil Sterile Solution (2.5 per cent), ampules of 5 cc., boxes of 5 and 50; ampules of 10 cc., boxes of 5; bottles of 50 cc. with rubber diaphragm stopper.

Prontylin tablets of 5 grains and 7½ grains, bottles of 25, 100 and 1000; repurified powder, bottles of 1 oz.

Detailed literature on request.

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Pharmaceuticals of merit for the physician

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PRONTOSIL

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Disodium 4-sulfamido-phenyl-2-azo-7-acetyl-amino-1-hydroxynaphthalene 3,6-disulfonate

SOLUTION FOR INJECTION

PRONTYLIN

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Brand of SULFANILAMIDE

p-Aminobenzenesulfonamide

TABLETS FOR ORAL USE

GOOD RED BLOOD-CELL RISE

in the Anemic Youngster

with

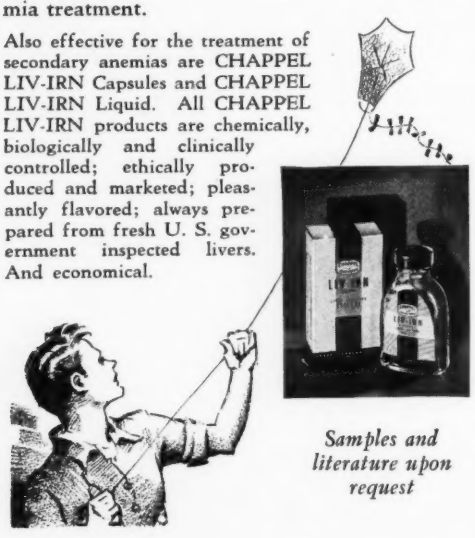
LIV-IRN TABLETS

(CHAPPEL)

Efficient treatment of children with secondary anemias presents no problem when you prescribe LIV-IRN Tablets. Pleasant to take, LIV-IRN Tablets usually bring about a reticulocytosis within 4 to 10 days with subsequent rapid maturing of red blood-cells. Improved appetite and digestion is generally noted. Each LIV-IRN Tablet contains 3 grains (200 mgm.) of reduced iron in non-irritant, non-astringent form—4 grains (267 mgm.) of liver extract, (secondary anemia fraction)—and quantities of Vitamins B_1, B_2 (G) and D.

LIV-IRN Tablets are available in bottles of 75 and 500 tablets—an economical form of anemia treatment.

Also effective for the treatment of secondary anemias are CHAPPEL LIV-IRN Capsules and CHAPPEL LIV-IRN Liquid. All CHAPPEL LIV-IRN products are chemically, biologically and clinically controlled; ethically produced and marketed; pleasantly flavored; always prepared from fresh U. S. government inspected livers. And economical.



Samples and literature upon request

Chappel CHAPPEL LABORATORIES **Laboratories**

DIVISION OF

CHAPPEL BROS., INC., ROCKFORD, ILLINOIS

Continued from page 40

Dr. James Pleasant Matheson, Charlotte, aged 59, died August 5 from injuries received in an automobile accident.

OKLAHOMA

Dr. Maurice L. Peter, Blackwell, has been made Medical Director of Kay County.

Dr. Glen W. McDonald, Ada, has been made Health Officer for Pontotoc County.

Dr. James T. Lowe, Mangum, has been made Health Officer of Greer County.

Dr. E. H. Shuller, McAlester, has been made President of the Southeastern Oklahoma Medical Association.

Dr. Paul J. Craden, El Reno, has returned after attending clinics in Chicago, Philadelphia and St. Louis.

Dr. William J. Trainor, Tulsa, has been taking special work in Massachusetts.

Dr. C. L. Border, formerly of Mangum, has moved to Oklahoma City.

Dr. Glenn J. Collins, formerly of Oklahoma City, has moved to McAlester.

Deaths

Dr. Charles Hicks Howell, Meeker, aged 68, died June 30.

Dr. Carlton A. Smith, Oklahoma City, aged 65, died recently.

Dr. Isaac W. Young, Langston, aged 63, died June 8.

Dr. George Millard Clifton, aged 61, died June 22 of coronary thrombosis.

Dr. A. A. West, Guthrie, aged 65, died July 4.

Dr. L. C. Lain, Oklahoma City, died June 30.

SOUTH CAROLINA

Dr. Wilbert Kenneth Rogers and Miss Mary C. Benton, both of Loris, were married in June.

Dr. William Jervey Ravenel, Charleston, and Miss Kathryn Geer Martin were married June 19.

Dr. William O. Whetsell, Bowman, and Miss Margaret Elizabeth Daniel were married in June.

Dr. Herbert Blake, Anderson, and Miss Mary Clarence Bramlette were married in June.

Dr. Edwin Emmons Corcoran, Lancaster, and Miss Dorothy Rowe Lucas were married June 5.

Deaths

Dr. William W. Watkins, Clemson, aged 84, died May 1 of heart disease.

Dr. E. C. Brasington, Kershaw, aged 77, died July 30.

TENNESSEE

The Health and Safety Department of the Tennessee Valley Authority has been moved from Knoxville to Chattanooga.

Dr. Everett E. Carrier, Johnson City, has been made Health Officer of Washington County, succeeding Dr. Wallace L. Poole, resigned.

Dr. John Morgan Clark, formerly of Rockwood, has moved to Fairfax, Alabama.

Dr. John Max McCulloch, Maryville, and Miss Maria Elizabeth Bryan were married July 2.

Dr. Howard Thompson Holden, Chattanooga, and Miss Dorothy Rodes were married in June.

Dr. Robert Wesley Brandon, Jr., Martin, and Miss Mary Frances Harris were married recently.

Deaths

Dr. Rufus Moos Wallace, Corryton, aged 80, died May 15.

Dr. James Atkin Sewell, Rockwood, aged 88, died June 5.

TEXAS

Dr. L. C. Wayland, Plainview, has been made Health Officer of Hale County to succeed the late Dr. E. F. McClendon.

Dr. George M. Decherd, Austin, has been made Health Officer of that city to succeed Dr. Eugene O. Chimene.

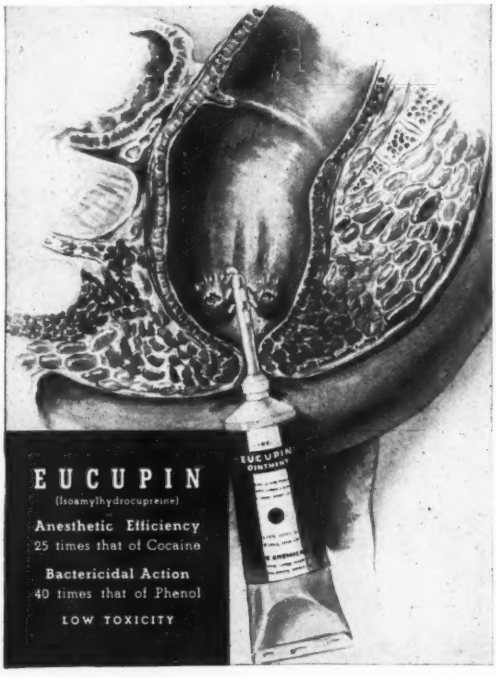
Dr. Holloway Bush has been made Assistant Health Officer of Dallas County to succeed Dr. William Tsukuhara.

Dr. D. M. Rumph, Fort Worth, has been made Chairman of the Board of Directors of the Fort Worth-Tarrant County Hospital.

Dr. W. R. Klingensmith, Amarillo, has been taking postgraduate work in Boston.

Continued on page 44

Prompt and Sustained Local Anesthesia with Powerful Antisepsis



EUCUPIN OINTMENT 1%— Its unusually prolonged anesthetic action, high germicidal efficiency, and low toxicity recommend its use in Hemorrhoids · Pruritus · Ulcers · Dermatosis · Burns · Severe Sunburns · Skin Abrasions · Fissures.

EUCUPIN OINTMENT is also valuable as a lubricant in digital or instrumental examinations, and as a post-operative application.

SUPPLY: 1 oz. collapsible tubes with detachable labels (pile pipe supplied); 1 lb. dispensing jars.

Presented as a Prescription Item to the Medical Profession Only

EUCUPIN OINTMENT 1%

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Literature and a trial quantity will be gladly supplied upon request

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Medicinal Products of "Rare" Merit

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HORLICK'S *the Original* MALTED MILK

Answers many diet problems:

1. A dependable, easily digested food for infant or growing child.
2. A nourishing food-drink for the nursing mother.
3. A beneficial table beverage.
4. A delicate food for the sick or convalescent. Horlick's prepared with water has been found to definitely stimulate the appetite. (Am. Jrl. Dis. Child. 40:305)
5. A light luncheon, at any time, for the doctor and his family.

HORLICK'S MALTED MILK CORP.
Racine, Wis.

Continued from page 42

Dr. P. E. Fish, Electra, has been taking postgraduate work in Los Angeles and San Francisco.

Dr. Leo J. Van Den Bossche has moved from Skidmore to Benavides.

Dr. J. B. Brown has moved from Kountze to LaGrange.

Dr. W. A. Bullock has moved from Borger to Lubbock.

Dr. Clem M. Carrithers has moved from Kenedy to Kingsville.

Dr. L. L. Daviet has moved from Beaumont to Las Cruces, New Mexico.

Dr. Thom G. Edwards has moved from Cross Plains to McGregor.

Dr. Chase Eiland has moved from Rochester to Munday.

Dr. Edythe Hershey has moved from Austin to Washington, D. C.

Dr. J. W. Howze has moved from Corpus Christi to Pampa.

Dr. C. F. Osborne has moved from Sherman to Pasadena, California.

Dr. John F. Pilcher has moved from Galveston to Corpus Christi.

Dr. R. A. Roberts has moved from Plainview to Pecos.

Dr. Robert C. Rowell has moved from Uvalde to Kenedy.

Dr. Charles B. Sanders has moved from Dallas to Houston.

Dr. Charles A. Shoultz has moved from Buchanan Dam to Bay City.

Dr. L. W. Spikes has moved from Sanatorium to Oakville, Tennessee.

Dr. G. Arnold Stevens has moved from El Paso to Hollywood, California.

Dr. R. G. Turner has moved from Daingerfield to Nacogdoches.

Dr. Steve F. Turner has moved from Paris to Ozark, Arkansas.

Dr. J. H. Steger, Fort Worth, and Miss Helen Presley were married July 7.

Dr. Eugene N. Smith, Gainesville, and Miss Frances Marion Beeson were married June 20.

Dr. Frank B. Duncan, Amarillo, and Miss Estelle Bain were married July 3.

Continued on page 46

Accuracy-PLUS
Lifetime Baumanometer
STANDARD FOR BLOODPRESSURE
Everything to promote perpetual accuracy and lasting qualities, to enhance its beauty and to make it simple, compact, light and handy, is in every Baumanometer as it comes to the physician of today.
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PORTABILITY
STEEL RESERVOIR
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ACIDOSIS

—IT NEED NOT BE

Acidosis is a frequent complication of febrile disease and of metabolic disorders. It tends to aggravate the disease, it probably prolongs it, eases the way to complications and sequelae, and retards convalescence. The untoward influences of acidosis can be curbed by supporting the alkali reserve with Alka-Zane. Alka-Zane supplies the four principal bases of which the reserve is composed: sodium, potassium, calcium and magnesium. The carbonates, citrates and phosphates of these elements are combined in a pleasant-tasting, effervescent salt that makes a zestful, refreshing drink in water.

Alka-Zane is supplied in bottles of 1½, 4 and 8 ounces. Trial supply gladly sent on request. William R. Warner & Co., Inc., 113 West 18th Street, New York City.

ALKA ZANE

Continued from page 44

Dr. W. B. Swift, Fort Worth, and Miss Dortha Rowland were married July 12.

DEATHS

Dr. Charles Baxter Harwood, Houston, aged 63, died June 6 of carcinoma of the face with metastasis.

Dr. Green Herschel De La Perriere, Irving, aged 54, died June 14 of coronary thrombosis.

Dr. Eugene C. Gordon, Columbus, aged 75, died June 10 of chronic myocarditis and arteriosclerosis.

Dr. Edgar F. McClendon, Plainview, aged 70, died July 25.

Dr. Andrew Warwick Duke, Center, aged 63, died June 3 of bronchopneumonia.

VIRGINIA

The Medical Society of Virginia will meet in Roanoke October 12-14.

The Southern Tuberculosis Conference met in Richmond September 29 and 30.

The Augusta County Medical Society has elected the following officers for the coming year: Dr. W. Alex. Murphy, Staunton, President; Dr. S. H. Garst, Staunton, Dr. I. M. Nuckols, Mt. Sidney, and Dr. George H. Thomas, Staunton, Vice-Presidents; Dr. Lyle S. Booker, Waynesboro, Secretary; Dr. J. E. Womack, Staunton, Treasurer.

Dr. W. W. Fuller, Arlington, has been made Assistant Health Officer of Arlington County.

Dr. J. L. Hamner, Mannboro, has been made Sergeant-at-Arms of the American Legion Post 87.

Dr. V. L. Kelly, Charlottesville, has been made a member of the Staff of Pinecrest Sanatorium at Beckley, West Virginia.

Dr. Kinloch Nelson, Richmond, has opened offices on West Franklin Street.

Dr. Clifford H. Beach, Richmond, has opened offices on West Franklin Street.

Dr. C. S. Dodd and Dr. J. E. Hamner, Petersburg, have formed a partnership for the practice of ophthalmology and otolaryngology.

Dr. R. Campbell Manson, Richmond, announces his association with Dr. Thomas W. Murrell.

Dr. Carl Wise Meador and Miss Margaret Anita Mitchell, both of Richmond, were married July 7.

Dr. James William Elliott, Lebanon, and Miss Frances Love Jackson were married in August.

Dr. William Ribble Pretlow and Miss May Fletcher Tiffany, both of Warrenton, were married July 24.

Dr. R. Terrell Johnson, Manassas, and Miss May Margaret Bell were married July 17.

Dr. Charles Hampton Mauzy, Jr., Harrisonburg, and Miss Elizabeth Anne Thaxton were married June 19.

Dr. Frederick Ralph Person, Williamsburg, and Miss Dorothy Italena Speese were married June 12.

Dr. James Eugene Hemphill, Petersburg, and Miss Mary Nancy Ray were married June 21.

DEATHS

Dr. Robert Paul Jones, Norfolk, aged 60, died June 3 of uremia.

Dr. Sydney John Baker, Richmond, aged 73, died August 7.

Dr. Guy Hart Moates, Langley Field, aged 42, died August 1 from injuries received in an airplane accident.

Dr. John Harris Smith, Floyd, aged 28, died August 9.

WEST VIRGINIA

The Hospital Association of West Virginia will meet in Wheeling October 7 and 8.

Dr. Walter E. Vest, Huntington, has been made President of the Public Health Council of West Virginia.

Dr. Turner E. Cato, New Cumberland, has been made Health Officer of Kanawha County.

Dr. J. W. Ruckman, West Liberty, has been made College Physician to the West Liberty Teachers College.

Dr. Charles N. Scott, Alloy, has been made Head of the Bureau of Venereal Disease of the State Health Department.

Dr. Donald L. Butterfield, Moundsville, has been made Medical Adviser of the State Department of Public Assistance.

DEATHS

Dr. J. M. Carney, Elizabeth, aged 85, died in June of senility.

Dr. Harry F. Nolte, Wheeling, aged 41, died August 11.

THELESTRIN

OVARIAN FOLLICULAR HORMONE

A standardized preparation of the ovarian follicular hormone for intensive ovarian therapy by hypodermic injection.

Indicated in the treatment of scanty menstrual flow, amenorrhea and the vasomotor and nervous symptoms of the menopause.

Each ampoule contains 25 rat units standardized by the Allen-Doisy method.

Boxes of 6 1-cc. ampoules

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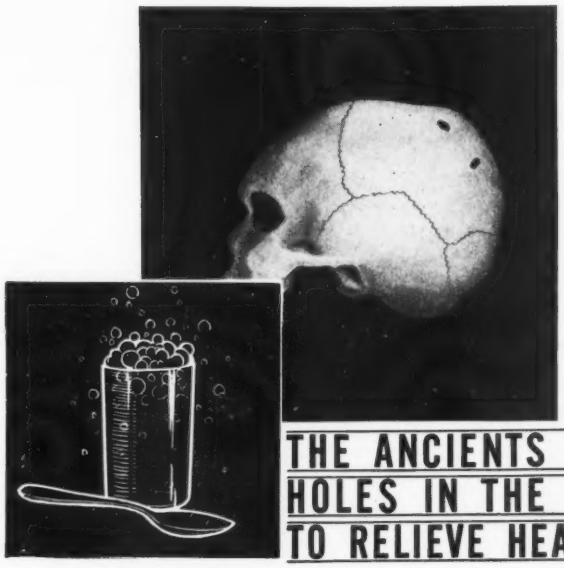

THE ANCIENTS BORED HOLES IN THE SKULL TO RELIEVE HEADACHE

Prehistoric man perforated the skull to relieve headache. The object of this trepanation was to give the confined demon an opportunity to escape. Many people underwent this harrowing ordeal several times during their lifetimes.

MODERN PHYSICIANS

use safe and more gentle methods to effectively relieve headache, migraine, neuralgia and other pain.

ACETANILID

is one of the most frequently used of modern analgesics, because of its prompt efficiency and relative non-toxicity. Authoritative evidence in regard to the worth of acetanilid as a pain reliever mounts steadily.

A scientifically made pharmaceutical, Bromo-Seltzer, containing acetanilid and its synergists, caffeine and bromide, for maximum results with minimum dosage, is at the physician's disposal. Citrates give palatable effervescence and alkalinity.

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Research, Constant Research

continues to improve the quality of Mead's Brewers Yeast* in the following respects, *without increased cost to the patient:*

1. Vitamin B potency raised to not less than 25 International units per gram.
2. Bottles now packed in light-proof cartons, for better protection.
3. Improved bacteriologic control in harvesting and packing.
4. **And NOW, since August 1, 1936, all bottles are packed in vacuum. This practically eliminates oxidation. Mead's Yeast stays fresh longer, as you can tell by its improved odor and flavor!**

*A dietary accessory for normal persons, for the prevention and treatment of conditions characterized by partial or complete deficiencies of vitamins B1 and G, as in beriberi, pernicious vomiting of pregnancy, anorexia of dietary origin, alcoholic polyneuritis, pellagra.

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Mead's Brewers Yeast Tablets in bottles of 250 and 1,000. Mead's Brewers Yeast Powder in 6 oz. bottles. Not advertised to the public. Samples to physicians, on request.

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How Much Sun Does the Infant Really Get?

Not very much: (1) When the baby is bundled to protect against weather or (2) when shaded to protect against glare or (3) when the sun does not shine for days at a time. Oleum Percomorphum offers protection against rickets 365¼ days in the year, in measurable potency and in controllable dosage. ***Use the sun, too.***

Oleum Percomorphum Price Substantially Reduced Sept. 1, 1936!

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Mead Johnson & Company, Evansville, Indiana, U. S. A., does not advertise any of its products to the public.

MAPHARSEN

MAPHARSEN is easily and quickly prepared for injection. Single doses can be dissolved in syringe and ampoule, without necessitating the use of sterile beakers or other apparatus.

In contrast to the arsphenamines, Mapharsen solutions do not become more toxic on standing; agitation or exposure to air does not increase their toxicity. Haste in completing injections immediately after preparation of solutions is unnecessary.

With the patient either in a sitting or recumbent position, injection can be made according to the usual intravenous technic. Mapharsen solutions should be injected *rapidly*—at the rate of 10 cc. (the entire dose) within 30 seconds after the needle is in place.

Mapharsen treatment is conveniently administered. The ease and rapidity of injection minimize discomfort and encourage patient cooperation.

Mapharsen (meta-amino-para-hydroxy-phenylarsine oxide hydrochloride) is available in single dose ampoules containing 0.04 and 0.06 Gm., each in individual packages with or without distilled water. It is also supplied in ten dose ampoules, containing 0.4 and 0.6 Gm., for use by hospitals and clinics

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